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U.S. Army Toxic and Hazardous Materials Agency

Report of Sampling and Analysis Results

Clementon Army Housing Units
Clementon, New Jersey

April 1991

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Prepared for:

U.S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
Aberdeen Proving Ground
Maryland 21010-5401

Prepared by:

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Under the supervision of:

Environmental Assessment and Information Sciences Division
Argonne National Laboratory
Argonne, Illinois 60439

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Roy F. Weston, Inc. has conducted a sampling and analysis program of the Army housing property located in Clementon, New Jersey. The objectives of this effort include further characterization of environmental contamination identified in an enhanced preliminary assessment carried out in 1989. The specific activities performed at this site were identification, evaluation of the condition, and collection of samples from specific suspected asbestos-containing materials, including floor tiles, pipe run and pipe fitting insulation, dust in the ductwork, and exterior siding, where present, collection and analysis of soil samples from utility trenches. These evaluations were necessary to clarify potential environmental issues identified in the earlier report, prior to the sale or realignment of the property.

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SAMPLING AND ANALYSIS AT THE U.S. ARMY FAMILY HOUSING UNIT (FHU) PROPERTY CLEMENTON, NEW JERSEY

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EXECUTIVE SUMMARY

The U.S. Army family housing units (FHUs) at Clementon, New Jersey were inspected by Roy F. Weston, Inc. (WESTON) personnel during February and March 1990 to further evaluate the environmental concerns identified in the enhanced Preliminary Assessment reports prepared and submitted earlier by Argonne National Laboratory (ANL) for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA). Three of the twenty-four single-family "Capehart" housing units were examined on 19 February to investigate the possible presence of asbestos-containing materials (ACM). The utility trench which once connected the Nike control site to the family housing units was examined and soil samples were collected on 06 March 1990. Additionally, samples of the insulating oils in the Army-owned transformers serving the housing units were collected on 27 February 1990.

The ANL Draft Sampling and Analysis Plan, Revision 1 (SAP) specified identification and sampling of the following materials that frequently are suspected to contain asbestos, from ten per cent of the housing units or a minimum of three of the housing units, whichever is greater:

- Pipe run insulation.
- Dust accumulated inside heating ductwork within the concrete slab, where present and open.
- Vinyl floor tiles.

The WESTON personnel selected three housing units for inspection after review of maintenance records and drawings, discussions with housing management personnel, and determination that the units were in similar condition. The housing units chosen, Nos. 311, 320, and 324, were considered to be representative of the other twenty-one units, but this was not confirmed by an examination of all the units. These units were selected because they had sustained less vandalism than the others.

Six samples of pipe run insulation and eight samples of floor tile and vinyl sheeting were collected by WESTON and analyzed. These analyses revealed that asbestos is present in pipe run insulation and in vinyl floor coverings at the three housing units examined. Asbestos was quantified at 1% or greater by polarized light microscopy (PLM) in seven of the floor covering samples, and was qualitatively identified in the other sample by transmission electron microscopy (TEM). At least 2% asbestos was found in all six pipe run insulation by PLM. No dust was collected from the heating ductwork because of the amount of debris that was present in the units, which, in most cases, completely covered the floor vents.

The following practices should be observed with regard to the known and suspected asbestos-containing materials identified:

- Pipe run insulation in all of the units inspected was in poor condition and debris from the insulation was on the floors due to the amount of vandalism that has occurred at the facility. All of the samples collected were found to contain asbestos, in some cases as much as 20%. The asbestos-containing pipe run insulation should be removed and disposed of following proper United States Environmental Protection Agency (EPA) guidelines.

- The risks posed by the possible asbestos-containing dust in the ductwork could not be evaluated, since no samples were collected. However, the debris within the units appears to be strewn with asbestos-containing pipe insulation, which may pose exposure risks to workers who may be assigned to clean up the facilities.

- The vinyl floor coverings pose no significant risk as long as they are in good condition and are not damaged by excessive wear or misuse. However, the walk-through performed by WESTON personnel in all twenty-four units indicated that the floor covering in most of the units was damaged and in poor condition. In units that have little or no damage to the floor tiles, the tiles should be left in place and managed under an Operations and Maintenance (O&M) program which describes procedures for the regular inspection of the floor coverings and the removal and replacement of any that become damaged. In those units where the floor covering is badly damaged, the tiles should be removed following the recommended EPA procedures, and replaced, if the buildings are to be reoccupied. Removal must be evaluated on a case-by-case basis prior to demolition, according to EPA guidelines.

- The asbestos-containing materials that are in the debris in these units pose the most significant risk of asbestos exposure, due to their nature and deteriorated condition. The debris be must be removed using trained asbestos abatement workers following a detailed asbestos removal plan. The debris must be disposed of as asbestos-containing waste, at a landfill that is permitted to accept asbestos waste.

- Further studies, such as air sampling, have been recommended at other facilities to determine if asbestos is becoming airborne and to define what risks, if any, are presented by these findings. These studies could not be performed at this facility as a part of the follow-up effort because of the damage to the units.

Sampling of the utility trenches was performed in accordance with the SAP. Five samples, including four from the utility trench and one of background soil, were collected and analyzed to determine whether volatile organic compounds (VOCs), semi-volatile organic compounds (base-neutral and acid extractables or BNAs), metals, sulfides, or cyanide were present. The results of these efforts reveal that six metals, arsenic, chromium, nickel, silver, tin, and vanadium, were present at levels significantly above the background sample. However, the concentration levels of metals and distribution pattern do not indicate that a significant contamination problem exists. No volatile or semi-volatile organic compounds were identified at concentrations that significantly exceeded both the detection limit and the background level. Total sulfide and cyanide were not detected at quantifiable concentrations in any of the samples. These findings indicate that there is probably no significant concern of damage to the overall environment due to possible contamination by Nike wastes.

Examination of the electrical supply system at the property revealed that five Army-owned transformers which may contain polychlorinated biphenyls (PCBs) are located on the property. The transformers appear to be about 35 years old and are in fair-to-good condition. All electrical power to this facility has been turned off and these devices were not energized. Efforts to collect samples of the insulating oils were successful at this site. Based on the laboratory results, WESTON concludes that four of these transformers contain PCBs, and recommends the units be designated and labeled as PCB-containing transformers, pending their ultimate removal and disposal.

SECTION 1. INTRODUCTION

SAMPLING AND ANALYSIS AT THE U.S. ARMY
FAMILY HOUSING UNIT (FHU) PROPERTY
CLEMENTON, NEW JERSEY

SECTION 1. INTRODUCTION

Roy F. Weston, Inc. (WESTON) was retained by Argonne National Laboratory (ANL) to provide assistance in gathering additional environmental data for the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) at 53 family housing unit properties (FHUs) in 12 states. The Clementon, New Jersey property is one of these FHUs.

1.1. PURPOSE AND SCOPE

The purpose of this project was to provide the Department of the Army with sound environmental data on the properties which are scheduled for sale or realignment as a result of the Defense Authorization Amendments and Base Closure and Realignment Act (Public Law 100-526). Environmental assessments of each property covered by the Act are required by the Secretary of Defense prior to their closure or realignment. Such actions must be performed in accordance with applicable provisions of the National Environmental Policy Act (NEPA) to ensure that any environmental hazards will be identified and mitigated where required.

Previously, ANL conducted enhanced preliminary assessments (PAs) for each property. These enhanced PAs made recommendations regarding sampling and analysis to determine (1) whether and in what quantities asbestos is present in certain building construction materials (including pipe run insulation, dust accumulated in heating ductwork, vinyl floor tiles, and exterior siding shingles, where present), (2) in selected contexts, whether and in what concentration soils and groundwater may be contaminated, and (3) whether and in what range transformer oils at selected sites may contain polychlorinated biphenyls (PCBs). WESTON gathered this data by implementing ANL's Draft FHU Sampling and Analysis Plan, Revision 1 (SAP).

1.2. SITE DESCRIPTION

The Department of the Army's FHU property in Clementon, New Jersey consists of 24 single-family housing units, a pump house, and a water tank. The Clementon housing area is located in southern New Jersey, in south-central Camden County, near the town of Erial, about 1.5 miles southeast of the towns of Clementon and Pine Hill, and about 12 miles southeast of Camden. The facility occupies 6.7 acres, and is located in a primarily rural area.

The Clementon housing facility consists of 24 "Capehart"-style single-family housing units, 11 two-bedroom units and 13 three-bedroom units, constructed in 1956. The single-story, wood-frame units were built on concrete slab foundations with no basements or crawl spaces. The ducts for the original heating system and domestic water lines were embedded in the concrete slab which was covered with vinyl floor tile. The units have pitched roofs covered with tar and gravel and exteriors finished with vinyl siding.

1.3. REPORT ORGANIZATION

This report contains the results of the sampling and analysis program performed by WESTON. Section 2 contains a description of the asbestos sampling performed at the property and laboratory results for samples of suspected asbestos-containing material (ACM) collected. Copies of field notes and laboratory reports pertaining to asbestos are provided in Appendices A.1 and A.2. Section 3 contains a description of the activities and findings resulting from the evaluation of the utility trench for the possible presence of hazardous materials. Copies of field notes and laboratory reports are provided in Appendices B.1 and B.2. Section 4 contains a description of field activities and the findings from the transformer examinations. Copies of field notes and laboratory reports are included as Appendices C.1 and C.2, respectively. Section 5 is a summation of all activities and findings for the Clementon property.

SECTION 2. ASBESTOS-CONTAINING MATERIALS

SECTION 2. ASBESTOS-CONTAINING MATERIALS

WESTON personnel inspected three of the 24 "Capehart" units at the Clementon family housing facility on 19 February 1990 for the presence of suspected ACM. Pipe run insulation, floor tile, and vinyl sheeting were the only suspect materials found within the buildings that were sampled. All sampling was done following the requirements of ANL's SAP. Additionally, all field work was performed in accordance with applicable Federal regulations, including 40 CFR Part 61 subpart M, 40 CFR Part 763 subpart E, and 29 CFR Part 1910.1001.

2.1. SAMPLING RATIONALE

The sampling rationale used by WESTON for this project followed the requirements set forth by ANL. The type of suspect ACM to be sampled, the number of housing units to be examined at each FHU facility, and number of samples to be taken for each material found were described in the SAP. The plan for Clementon required sampling of the following materials, if present:

- Pipe run insulation.
- Accumulated dust inside heating ductwork if not sealed.
- Vinyl floor tiles.

In accordance with the SAP, three units were examined at this facility. The sampling plan, however, did not identify specific units which were to be sampled. The task of determining which housing units were representative of the facility as a whole and, therefore, would be sampled was left to the WESTON field team. After reviewing all available maintenance records and drawings and discussing the facility with Directorate of Engineering Housing (DEH) personnel, it was determined that all of the units at the Clementon FHU were similar in condition. Following a brief walk through of all units, Units 311, 320, and 324 were chosen for sampling by the WESTON field team leader, because they had experienced less damage from vandalism.

The SAP specifies that a minimum of two pipe run insulation samples, four dust samples, and one sample of each color of floor tile be collected from each of the housing units examined. Six pipe run insulation samples and eight samples of vinyl floor coverings were collected at the facility. No dust samples were collected due to the large amount of debris that was present in the units, which completely covered the floor vents in most cases. Meaningful samples of the dust could not be collected due to this vandalism.

2.2. FIELD ACTIVITIES AND OBSERVATIONS

Each of the units was inspected to determine if suspect materials were present. The pipe runs for the domestic water supply system in the units were once insulated with a corrugated paper, air-cell type insulation. Due to extensive vandalism and theft of copper water pipes from all of the units, the pipe run insulation is in very poor condition (See Figures 2.1 and 2.2). Six samples of pipe run insulation were collected for analysis. The pipe run insulation is friable, as defined in the United States Environmental Protection Agency (EPA) regulations, meaning that it can be crushed, crumbled, pulverized, or otherwise reduced to a powder using hand pressure. Friable asbestos-containing materials (ACM) are considered to be more hazardous than non-friable ACM since they are much more likely to release asbestos fibers. Because of its friability and instances of damage, the pipe run insulation is considered to be the most hazardous type of ACM in the Clementon FHU.

FIGURE 2.1 PIPE RUN INSULATION IN THE KITCHEN OF UNIT 320

FIGURE 2.2 PIPE RUN INSULATION IN THE KITCHEN OF UNIT 311

Heating ductwork vents in all twenty-four units were not sealed, but, due to the extensive damage the units have sustained, no dust samples could be collected. It was decided by the WESTON field team leader that there was too much debris in the units to obtain a representative sample of dust in the ductwork.

Three colors, black, red, and tan, of 9" x 9" vinyl floor tile, three colors, brown, black, and white, of 12" x 12" vinyl floor tile, and one color of vinyl sheeting were sampled. Unit 320 contained vinyl sheeting and brown 12" x 12" tile. Unit 324 contained tan, black, and red 9" x 9" tile and black 12" x 12" tile. Unit 311 contained brown and white 12" x 12" tile. One sample of each of the floor tile and vinyl sheeting types was taken in each housing unit, resulting in a total of eight samples for laboratory determination of asbestos content. These samples were taken by breaking off a small piece of material in an inconspicuous location. About one square inch of the tile surface area was taken for each sample. No effort was made to separate the mastic, which sometimes contains asbestos, from the floor tile samples themselves.

The vinyl floor tile in all three of the units inspected was heavily damaged and delaminated from the floor in places. This material is considered to be a non-friable type of ACM, unless damaged. When significant damage occurs, such that the material becomes friable as defined in the asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), the U.S. Environmental Protection Agency (EPA) would classify these tiles as friable materials. However, an EPA interpretation was recently released that changes certain previous interpretations regarding non-friable ACM. On 23 February 1990, a memorandum was jointly issued by the Director of Emissions Standards Division, the Director of Stationary Source Compliance Division, and the Associate Enforcement Counsel for Air Enforcement of the EPA Office of Air Quality Planning and Standards (OAQPA). This memorandum was circulated to other air quality officials and EPA regional offices in early March 1990. This latest position states that floor tiles and certain other non-friable materials do not have to be removed from a facility prior to demolition, unless they are severely damaged and thus are considered friable, or unless the demolition may cause fiber release through grinding or abrasion of the tiles. Floor tile removal shall be done if demolition is to be accomplished by burning, either of the unit or of the debris from demolition. However, if the floors in the housing units are to be renovated, special care must be taken during the process to prevent the release of asbestos fibers.

The WESTON field team was directed, as a part of the project scope contained in the SAP, to perform sampling and analysis of specific suspect ACM. Other suspect materials observed were roofing felt and cloth expansion joints. Copies of the field notes are included in Appendix A.1.

2.3. LABORATORY PROCEDURES AND RESULTS

The bulk samples of building materials were analyzed for asbestos content by WESTON's optical microscopy laboratory in Auburn, Alabama. This laboratory is accredited by the American Industrial Hygiene Association (AIHA) and the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP). The bulk samples were analyzed by Polarized Light Microscopy (PLM) using the EPA's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples", EPA 600/M4-82-020, December 1982. Copies of the laboratory reports are included in Appendix A.2.

Vinyl floor tile samples for which no asbestos was found using PLM methods were analyzed qualitatively for the presence of asbestos by Transmission Electron Microscopy (TEM) at WESTON's NVLAP accredited electron microscopy laboratory in Auburn, Alabama. Copies of these laboratory reports are also included in Appendix A.2.

All analyses were performed in accordance with protocols set forth in the Laboratory Accreditation package submitted by WESTON under NVLAP. This document includes standard procedures for sample analysis and quality assurance / quality control (QA/QC) which were acceptable to NIST. The QA/QC protocols for the laboratory differ significantly from those commonly found in chemical analysis procedures, due to the nature of the analytical procedure. Since there are no reagents, digestions, or other steps in the process that provide significant opportunities for sample contamination or analyte loss, lot blanks and sample spikes are not performed. Instead, all analyses are performed using the following steps:

- Incoming samples are divided into lots of ten for analysis.

- One sample is selected at random to serve as the QC check and divided into two containers.

- The sample lot is assigned to an analyst who determines the asbestos content of each sample.

- The QC sample is analyzed by a different analyst, designated by the sample custodian.

- The results of both analysts are submitted to the QC Coordinator for review, and comparison to the laboratory QC chart.

- The results are reviewed and approved, based on the written QC review procedures, or rejected. If rejected, the sample lot and QC sample are reanalyzed.

The WESTON laboratory routinely runs blank checks to ensure that equipment and refractive index oils are not contaminated, collects and analyzes samples of the air in the work areas to document that airborne asbestos fibers do not threaten worker health or sample contamination, and analyzes samples submitted by NIST to document precision of results as required by the NVLAP program. Samples provided in past rounds of proficiency checks are used for analyst training and to document analyst proficiency. The use of third party laboratory comparisons is often done, and is accomplished by sending duplicates of samples to an outside laboratory and comparing the results obtained by the two facilities.

In interpreting the asbestos results, it should be noted that the definition of asbestos presence differs between the EPA and some state agencies. According to the EPA definition, any materials that contain greater than one per cent (>1%) asbestos are classified as ACM by the 1977 NESHAP regulations. However, California has recently implemented state regulations that consider all materials containing 0.1 per cent (%) or more asbestos as asbestos-containing. It is believed that several other states will soon follow the lead of California in lowering the threshold limit to 0.1 per cent, including some in which properties under review in this study are located. Currently, the State of New Jersey continues to abide by the EPA definition, hence, all samples containing >1% asbestos are considered to be ACM.

The matter is further complicated by the fact that the PLM method was developed specifically for friable materials, but not for non-friable types of suspect ACM such as vinyl floor tiles, vinyl sheeting, and siding. In fact, no specific method has been developed and promulgated to date for such samples, so laboratories use PLM as the only available documented procedure for their analysis. PLM has an inherent limitation on fiber resolution of about 0.25 micrometer (um) in diameter and reliable detection and quantification of fibers smaller than 1 um in diameter is difficult. The manufacturing process for vinyl floor tiles, for example, results in the very small fiber diameters which often cannot be seen by PLM. WESTON's experience is that frequently such samples do, in fact, contain significant quantities of asbestos. WESTON

has developed a qualitative technique using TEM to detect the presence of such small fibers therefore to minimize false negatives in the laboratory results. This technique, however, does not result in identification of the type of asbestos present or allow a good quantitative estimate of asbestos content.

For these reasons, the WESTON laboratories have implemented a policy of reporting asbestos presence as follows:

- Asbestos determined by PLM to be present at greater than 1% is reported as the quantity detected.

- If asbestos is estimated to be less than 1% by PLM, it is reported as "<1%". This estimated asbestos content is often used when only one asbestos structure is observed.

- If asbestos is not detected in certain non-friable materials by PLM, then the samples are subjected to TEM analysis. The results are reported as positive if asbestos is detected by TEM.

Recommendations made in this report are based on the >1% regulatory limit, except for floor tiles as discussed earlier and except as otherwise noted. This represents a conservative approach to the assessment of asbestos presence at the facility.

Table 2.1 contains a summary of all samples collected at the Clementon FHU, including sample locations, material descriptions, and laboratory results. PLM results are quantitative while TEM results are qualitative only. Quantity estimates for materials sampled that were suspected to contain asbestos are presented in Table 2.2. The field notes describing the observations are provided in Appendix A.1, while copies of the original laboratory reports are included as Appendix A.2.

All six pipe run insulation samples were found to contain the chrysotile type of asbestos in a friable form at concentrations ranging from 2% to 20% using the PLM technique for analysis. This indicates that all of the "air-cell" type pipe insulation contains asbestos at a regulated level. The prevalence of fragments of this type of insulation in the debris covering the floors of the units indicates that this trash should be treated as an asbestos-containing material. Based on these observations, all units should be assumed to have friable asbestos insulation and friable asbestos in the debris.

Seven of the floor covering samples were found by PLM to contain 1% or greater asbestos. WESTON considers the 1% value reported for samples BY-186-01-NJ-324-AFT and BY-188-01-NJ-311-AFT to be sufficient to define the samples as asbestos-containing due to the analytical uncertainty of the PLM method when applied to floor coverings, as previously described. One sample for which no asbestos was reported following PLM analysis was found to contain asbestos fibers by the TEM procedure. While this result is qualitative in nature, consideration of the process through which floor coverings were manufactured leads to the conclusion that this material should be treated as ACM. Thus, all eight floor covering samples were found to contain asbestos. The twenty-one units not inspected should be considered to have ACM present in the floor tiles and vinyl sheeting unless additional sampling and analysis is performed and shows that no asbestos is present in these units.

TABLE 2.1
BULK SAMPLE SUMMARY
CLEMENTON FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	ASBESTOS CONTENT PLM ANALYSIS	CONFIRMATION TEM ANALYSIS
Unit 320				
BY178-01-NJ-320-AFT	Vinyl sheeting	Kitchen/Bathrooms	Chrysotile, 35%	
BY179-01-NJ-320-AFT	Brown 12" x 12" floor tile	Bedrooms/Living room/ Halls	Chrysotile, 5%	
BY180-01-NJ-320-API	Pipe run insulation	Kitchen	Chrysotile, 15%	
BY181-01-NJ-320-API	Pipe run insulation	Kitchen	Chrysotile, 20%	
BY182-01-NJ-320-API	Pipe run insulation	Kitchen	Chrysotile, 15%	
Unit 324				
BY183-01-NJ-324-AFT	Tan 9" x 9" floor tile	Living room/Bedrooms	Chrysotile, 15%	
BY184-01-NJ-324-AFT	Black 9" x 9" floor tile	Living room/Bedrooms	Chrysotile, 10%	
BY185-01-NJ-324-AFT	Red 9" x 9" floor tile	Kitchen	Chrysotile, 3%	
BY186-01-NJ-324-AFT	Black 12" x 12" floor tile	Kitchen	Chrysotile, 1%	
Unit 311				
BY187-01-NJ-311-AFT	Brown 12" x 12" floor tile	Living room/Bedrooms	None Detected	Positive
BY188-01-NJ-311-AFT	White 12" x 12" floor tile	Kitchen/Bathrooms	Chrysotile, 1%	
BY189-01-NJ-311-API	Pipe run insulation	Kitchen	Chrysotile, 5%	
BY190-01-NJ-311-API	Pipe run insulation	Kitchen	Chrysotile, 5%	
BY191-01-NJ-311-API	Pipe run insulation	Kitchen	Chrysotile, 2%	

TABLE 2.2
ASBESTOS CONTAINING MATERIALS
CLEMENTON FAMILY HOUSING

SAMPLE IDENTIFICATION	MATERIAL TYPE	LOCATION	QUANTITY	UNITS
Unit 320				
BY178-01-NJ-320-AFT	Vinyl sheeting	Kitchen, Bathrooms	210	Square ft
BY179-01-NJ-320-AFT	Brown 12" x 12" floor tile	Bedrooms/Living room/ Halls	605	Square ft
BY180-01-NJ-320-API	Pipe run insulation	Kitchen	30	Linear ft
BY181-01-NJ-320-API	Pipe run insulation	Kitchen	N/A	
BY182-01-NJ-320-API	Pipe run insulation	Kitchen	N/A	
Unit 324				
BY183-01-NJ-324-AFT	Tan 9" x 9" floor tile	Living room/Bedrooms	270	Square ft
BY184-01-NJ-324-AFT	Black 9" x 9" floor tile	Living room/Bedrooms	270	Square ft
BY185-01-NJ-324-AFT	Red 9" x 9" floor tile	Kitchen	10	Square ft
BY186-01-NJ-324-AFT	Black 12" x 12" floor tile	Kitchen	145	Square ft
Unit 311				
BY187-01-NJ-311-AFT	Brown 12" x 12" floor tile	Living room/Bedrooms	605	Square ft
BY188-01-NJ-311-AFT	White 12" x 12" floor tile	Kitchen/Bathrooms	210	Square ft
BY189-01-NJ-311-API	Pipe run insulation	Kitchen	30	Linear ft
BY190-01-NJ-311-API	Pipe run insulation	Kitchen	N/A	
BY191-01-NJ-311-API	Pipe run insulation	Kitchen	N/A	

2.4. CONCLUSIONS AND RECOMMENDATIONS

The sample analyses performed by WESTON have revealed that asbestos is present in all floor tile and vinyl sheeting types sampled in the three housing units examined and in all pipe run insulation in the two units where it remained. These units are thought to be representative of the other twenty-one at the site although having less vandalism, but this was not confirmed by sampling at all units.

Analytical results of the pipe run insulation confirmed that asbestos is present in all of the samples taken. All of the asbestos-containing pipe run insulation should be removed prior to renovation or demolition of the units, to comply with the NESHAP provisions. This work must be done by workers trained in asbestos abatement procedures. The material appears to be damaged to a degree that repair and management under an Operations and Maintenance (O&M) program is not a viable option.

The vinyl floor tiles in the three housing units inspected were in poor condition, having sustained significant damage due to neglect and vandalism. Due to this damage, the potential for release of asbestos fibers may be enhanced. Due to the deterioration of the tiles, they should be removed and replaced, if the buildings are rehabilitated and reoccupied. The recent EPA clarification of the definition for damaged non-friable materials apparently removes some concerns about the status of these materials at the time of demolition.

If any of the vinyl floor coverings can be left in place, they should be managed under an O&M program if the facility is not torn down. An O&M program must address the following:

- The locations of all known and suspected ACM.
- The procedures and frequency for periodically assessing the ACM in the facility.
- The procedures for safely handling the ACM during maintenance or removal activities.
- Designation of an asbestos coordinator for the facility.
- The responsibilities and requirements for training of personnel involved with maintenance and renovation of the facility.
- The record-keeping program for the facility.

These vinyl floor tiles should be removed during a planned renovation of the units, in accordance with the regulations applicable at the time.

The asbestos-containing debris and loose tiles should be removed and disposed of as asbestos waste to eliminate an exposure risk to workers at the facility, to trespassers, and to the environment. This effort may require abatement design, enclosure of the facilities, and use of personnel trained in asbestos abatement techniques.

Sampling and analysis for airborne asbestos was not performed at this site during the original study due to the fact that the facilities are abandoned and extensive vandalism has occurred. However, it is recommended by the U.S. Army Environmental Hygiene Agency (AEHA) that, if the units are to remain under

the management, operational control, or ownership of the Army, sampling and analysis for airborne asbestos be undertaken. These studies should be performed to provide data from at least ten percent or a minimum of three of the housing units, whichever is greater. This additional sampling and analysis effort, along with the other recommended actions, will help to ensure that there is no long-term exposure risk to the occupants or to maintenance personnel.

Other suspect materials noted were roofing felt and cloth expansion joints on the heater ductwork. Care should be taken during renovations or demolition to identify suspect materials that may have been hidden from the view of the assessment team. The suspect materials observed by the field team, and any hidden suspect materials found later, should be managed under an O&M plan until they are analyzed for the presence of asbestos or removed from the facility.

SECTION 3. NIKE WASTES

SECTION 3. NIKE WASTES

WESTON personnel conducted a site visit at the Clementon, New Jersey Family Housing Unit (FHU) on 28 February 1990, accompanied by a DEH maintenance representative. One purpose of the inspection was to locate a buried utility trench which was documented in the ANL SAP to facilitate the collection of soil samples for comparison with background soils collected outside the trench. The trench was identified as a potential contamination area that possibly received Nike-related wastes, such as chlorinated solvents and metals. The location of the utility trench where it ran between the FHU and the decommissioned Nike control site was verified by visual observation. The utility trench contained a buried water main connecting the two sites.

The primary objective of the SAP was to provide information that supplements the Enhanced Preliminary Assessment of the Clementon site conducted by ANL for USATHAMA. A selective analytical evaluation, Table 3.1, was performed in accordance with the SAP to identify the presence of specific contaminants and to define the general nature of contamination at a specific area of concern. The SAP was not designed or intended to characterize the movement, concentration or extent of contamination at the site.

3.1. SAMPLING RATIONALE

The rationale for sampling the buried utility trench at the Clementon, New Jersey Nike Site was identified by ANL in the draft FHU SAP. As described in the SAP, a shared utility trench connects the housing area with the nearby Nike control site. By virtue of its construction, it is possible that the buried utility trench may act as a subsurface conduit or migration pathway for chlorinated solvents, metals and other Nike-related wastes that may have been introduced into it. Little information was available at the site, because the DEH maintenance person who had filled that position for many years had recently retired. His replacement had been in that position for only a few months, and was unfamiliar with historical activities at the facility.

To investigate the trench, the sampling plan required that a minimum of two borings be made, one on each side of the utility trench where it exited the FHU property. The plan specified that two samples be collected from each boring at depths to be determined during field investigations. Initially, the sampling plan called for the collection of at least three background samples for each of the potential contaminated soil areas at a housing site. However, prior to the sampling at the Clementon site, this requirement was reduced by ANL to a single background sample per area.

The initial visit to the Clementon site revealed the location of the storm drain system for the housing units which seems to discharge into a drainage swale that is not associated with the Nike area. During the reconnaissance, a buried water main was discovered that appears to run from the water tank in the housing area to the Nike site which was located slightly upgradient. This buried trench could potentially serve as a conduit for Nike-related wastes, as described in the SAP. Soil boring locations were chosen on either side of the buried water line near a valve, the last point at which the water line could be located with relative certainty before it exited the FHU site.

3.2. SAMPLING METHODOLOGY AND OBSERVATIONS

Soil sampling of the buried utility trench was conducted on 06 March 1990. Two soil borings (SB-01 and SB-02) were drilled using a drilling rig with a hollow-stem auger and a drilling crew contracted from Empire Soil Investigations Incorporated. Soil samples were collected using the continuous split spoon method.

TABLE 3.1

SUMMARY OF SAMPLES COLLECTED AND ANALYSES PERFORMED
CLEMENTON, NJ, FAMILY HOUSING UNIT

SITE	POTENTIAL CONTAMINANT	SAMPLE MEDIUM	ANALYTES
Buried Utility Trench and Background Samples	Carbon Tetrachloride, trichloroethylene, trichloroethane and other Chlorinated Organic Solvents	Soil	VOC BNA
	Inorganics, including: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, tin, vanadium, and zinc	Soil	Metals Sulfide Cyanide

All split spoon samples were scanned with an HNu brand organic vapor detector prior to selecting the intervals for sampling and analysis. The 0 to 4.0 foot sample (01-NJ-SUT-01-01) and 6.0 to 10.0 foot sample (01-NJ-SUT-01-02) were collected for analysis from SB-01. The 0 to 4.0 foot sample (01-NJ-SUT-02-01) and 4.0 to 8.0 foot sample (01-NJ-SUT-02-02) were collected from SB-02 for analysis. The background sample was collected with a stainless steel hand trowel from the yard behind Unit 319. Sampling locations are shown in Figure 3.1.

The WESTON field team scientists described each soil sample, noting the texture, consistency, color, moisture content and any visible staining or observable odor. To minimize loss of any volatile organic compounds (VOCs) present, the soil samples for determination of VOCs were taken directly from the split spoon as soon as possible after extraction from the boring, using a small stainless steel scoop. The remaining soil from the interval sampled was homogenized in a stainless steel mixing bowl prior to being apportioned into the appropriate sample containers. All sample containers had been cleaned in accordance with the procedures outlined in the ANL sampling plan prior to sample collection.

The lids of the containers were secured and a custody seal attached after they were filled. Each sample was then labeled with its sample identification number, date of collection, and analyses requested, using the standard USATHAMA format. The samples were sealed in bags and placed on ice in an insulated cooler after collection. Before the start of sampling, between each sample, and upon completion of sampling, all equipment was decontaminated using an Alconox® and water solution followed by a rinse with distilled water.

The trench backfill material encountered while drilling at Clementon was composed primarily of sandy clay in Boring 1 and sand in Boring 2. Both borings showed an increase in gravel content with depth. The soil profiles for these borings are described in Table 3.2. Rainfall began shortly after commencing work on Boring 1, making operation of the HNu unfeasible. The 0 to 2 foot interval in Boring 1 had an HNu reading at background level, but no subsequent readings were obtained.

3.3. LABORATORY PROCEDURES AND RESULTS

All soil samples collected were analyzed for the parameters shown in Table 3.1. The VOC screens, sulfide, and cyanide analyses were performed by the WESTON analytical laboratory in Lionville, Pennsylvania. Of these three procedures, only the total cyanide method is included in the current USATHAMA certification program (USATHAMA Standard Method KY05). The VOCs were screened using USEPA Standard Method 3820 from "Test Methods for Evaluating Solid Waste", SW-846, and total sulfide was determined using USEPA Standard Method 9030.

The VOC procedure used for this effort is designed as a screening method to determine the approximate level of contamination in a soil or sludge sample. Approximately 10 grams of sample were removed from the container and transferred to a 50 mL centrifuge tube containing 40 mL of organic free water. The tube was sealed and shaken to mix the water with the sample. The sample was then centrifuged and the water transferred to a 50 mL separatory funnel. A 2 mL volume of hexadecane was added to the separatory funnel and shaken with the water for one minute. After the layers separated, reagent water was added to the separatory funnel to bring the organic layer up into the neck of the funnel. A one mL aliquot of the organic layer was transferred to a sample vial and analyzed by flame ionization gas chromatography. The results for these samples indicate that there was no significant concentration of volatile organic compounds detected in the samples.

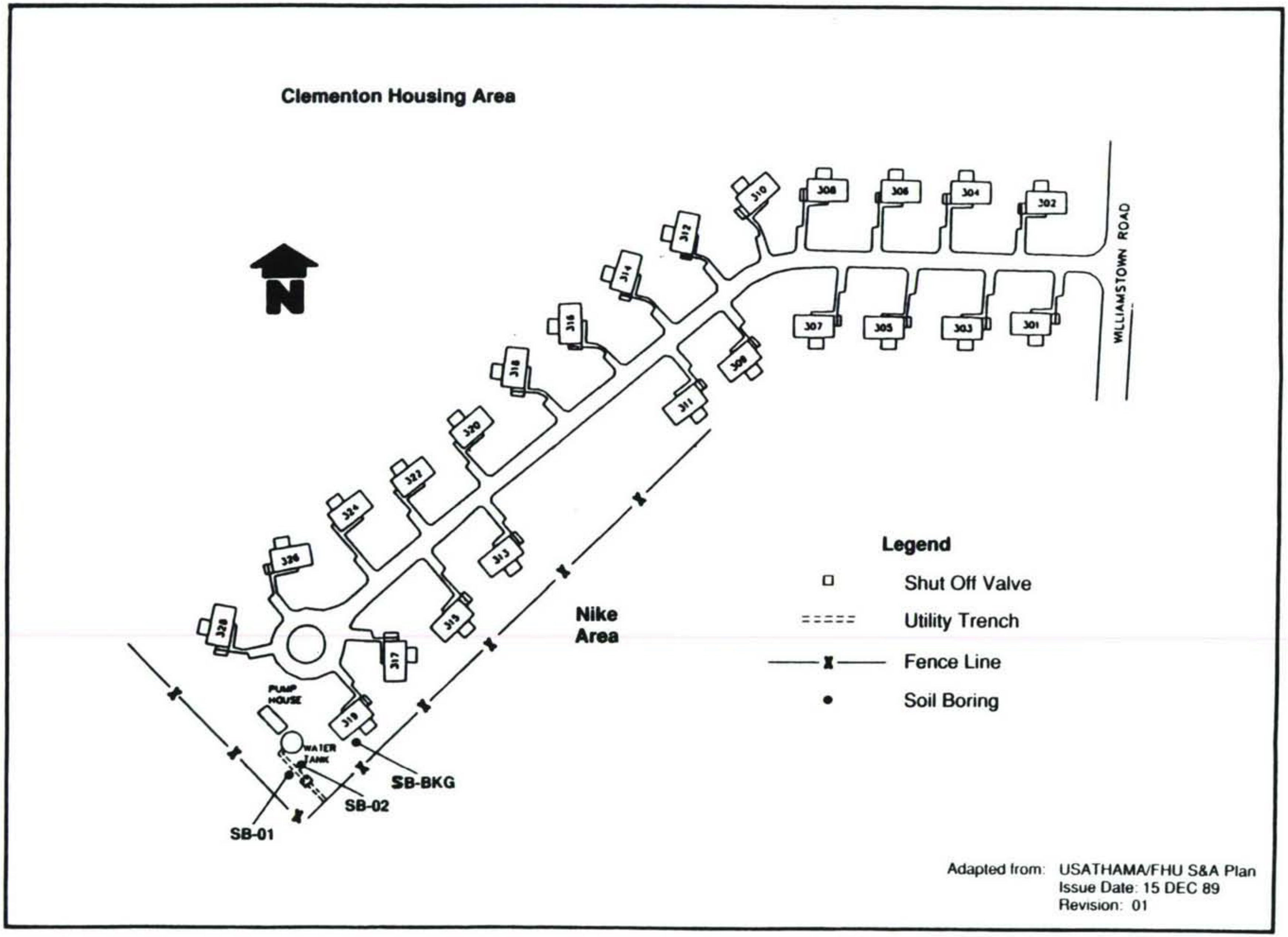

FIGURE 3.1. SITE PLAN OF FAMILY HOUSING, CLEMENTON, NJ

TABLE 3.2

SUMMARY OF SOIL BORINGS
SOIL BORING NO. 1

SAMPLE ID NUMBER	DEPTH INTERVAL (ft)	RECOVERY (ft)	GENERAL SOIL DESCRIPTION
01-NJ-SUT-01-01	0 - 2	1.3	0.0 - 0.5 medium brown sand, loamy, silty, fine to coarse grained. 0.5 - 1.3 yellow-brown and medium grained, some silt and clay, trace of gravel. HNu: background.
01-NJ-SUT-01-01	2 - 4	0.9	Orange-red sandy clay, moist, plastic, trace of gravel and pebbles.
---	4 - 6	1.2	Same as above.
01-NJ-SUT-01-02	6 - 8	1.1	Orange-red sandy clay, moist, plastic, some gravel.
01-NJ-SUT-01-02	8 - 10	1.4	Red brown gravelly clay, moist, plastic.
		SOIL BORING NO. 2	
01-NJ-SUT-02-01	0 - 2	1.3	Medium brown, gravelly, silty sand, fine to coarse grained, moist. Top 1 inch a sandy loam.
01-NJ-SUT-02-01	2 - 4	1.4	Medium brown, fine to medium grained sand, trace of gravel, trace of clay, wet.
01-NJ-SUT-02-02	4 - 6	1.4	0-0.6 same as above. 0.6-1.4 orange-red gravelly sand, some clay.
01-NJ-SUT-02-02	6 - 8	1.3	Same as above with a trace of clay.
---	8 - 10	1.4	Orange-red sandy gravel, trace of clay.

Note: Sample Identification Code
01 - Site Name (Clementon)
NJ - New Jersey
01 - Soil Boring
SUT - Soil, Utility Trench
01 - Soil Sample Depth

Studies were performed to determine the recovery efficiency of this technique for samples of both soil and water. Spikes of selected compounds of interest were prepared in both media and analyzed by the same procedures employed for the samples. The data gathered indicate that recovery of spikes from water samples is very good, typically above 90 per cent. The recovery from soils is not as high, however, but typically varies from about 30 to 70 per cent, depending on the compound. Since there were no significant organic compounds detected, the screening test showed that the utility trenches were not contaminated to a significant degree by the Nike wastes once present at or near the site.

The total cyanide method requires sample preparation by distillation of the cyanide to eliminate possible interferences. A color-forming reagent is then added to the distillate and the concentration of the colored reaction product determined by spectrophotometric techniques, allowing determination of the total quantity of cyanide present in the original sample. The sulfide procedure is performed by reacting the sulfide with excess iodine to form the iodide ion. The iodide thus formed is then determined by titration with a standardized solution of either sodium thiosulfate or phenylarsine oxide using a starch solution to detect the endpoint.

A subcontract was executed with the Arthur D. Little (ADL) Laboratory, located in Cambridge, Massachusetts, for the performance of the analytical determinations of trace metals and semi-volatile organic compounds (base-neutral and acid extractable compounds or BNAs). ADL is currently USATHAMA certified to perform these analyses. Analyses for mercury were performed on digests of the soil samples by cold-vapor atomic absorption (CVAA) spectroscopy, using USATHAMA standard method JB03. Arsenic, lead, selenium, and silver were determined by graphite furnace atomic absorption (GFAA) spectroscopy according to USATHAMA Method JD13, while other metals were determined by ICP using USATHAMA method JS10. BNA analyses were performed on extracts of the soil samples by gas chromatography/mass spectrometry (GC/MS), using USATHAMA Method LM15.

The metals analyses were performed by digesting the soil samples in a strong acid to dissolve all metals present, followed by filtration to remove any remaining solids such as silicon oxide, that may cause problems with the analytical instrument. The solutions were than analyzed by the selected method and the concentration of each metal in the original soil sample was calculated.

The method for semi-volatile organics required extraction of the soil samples with methylene chloride followed by concentration of the extract through evaporation of the volatile solvent. An aliquot of the concentrated extract was injected into the GC/MS system, which separated, identified and quantified each compound on the list of chemicals to be determined.

The laboratory results for metals, sulfide, cyanide and BNA analyses of the soil samples are available in the IRDMS database and are included in this report in Appendix B.2. These results have been validated according to USATHAMA policy. The conclusions stated in Section 3.4 are based on these results.

The results of metal determinations for the soil samples, Table 3.3, show that concentrations of six of the metals; arsenic, chromium, nickel, silver, tin, and vanadium, significantly exceed the concentrations in the background samples from this site. None of these were found at a level greater than 50 mg/Kg. Low levels, slightly above (less than three times) the concentration found in the background sample, were found for five other metals, including barium, beryllium, copper, manganese, and mercury. The above-background levels of various metals were detected in the samples in no particular pattern. Only chromium and vanadium

TABLE 3.3

RESULTS OF INORGANIC ANALYSES OF UTILITY TRENCH SAMPLES
CLEMENTON, NJ
(All values in mg/Kg of soil*)

SAMPLE ID		01-NJ-SUT-01-01		01-NJ-SUT-01-02		01-NJ-SUT-02-01		01-NJ-SUT-02-02		01-NJ-BKG-01		01-NJ-SUT-RNS
Metals Analyses												
Antimony	LT	4.3	LT	4.3	LT	4.3	LT	4.3	LT	4.3	LT	71.8
Arsenic		21.6		22.7		8.60		25.6		7.90	LT	2.76
Barium		23.6		25.1		15.2		14.7		14.0		1.64
Beryllium		0.100		0.200	LT	0.100		0.200	LT	0.100	LT	1.64
Cadmium	LT	2.0	LT	2.0	LT	2.0	LT	2.0	LT	2.0	LT	2.99
Chromium		18.0		19.5		11.5		18.2		5.1	LT	49.9
Cobalt	LT	2.4	LT	2.4	LT	2.4	LT	2.4	LT	2.4	LT	51.5
Copper		6.4		7.5		3.7		6.9		4.6	LT	21.9
Lead		15.7		14.9		30.0		18.4		93.8	LT	5.42
Manganese		17.7		21.6		16.3		14.2		15.7	LT	1.05
Mercury		0.100		0.100		0.048	LT	0.026		0.043	LT	0.566
Nickel		2.7		6.2		3.0		1.9		1.6	LT	32.3
Selenium	ND	4.10	ND	4.10	ND	4.10	ND	4.10	ND	4.10	LT	3.89
Silver	ND	0.030	ND	0.030	ND	0.030		0.67		0.050	LT	0.301
Thallium	LT	2.8	LT	2.8	LT	2.8	LT	2.8	LT	2.8	LT	44.4
Tin	LT	10.0		16.0	LT	10.0		12.5	LT	10.0	LT	0.2
Vanadium		13.7		19.3	LT	4.7		17.0	LT	4.7	LT	49.5
Zinc		13.6		11.4		18.5		6.1		23.4	LT	42.4
Total Cyanide	LT	0.60	LT	0.60	LT	0.60	LT	0.60	LT	0.60	LT	0.25
Total Sulfide	LT	0.28	LT	0.28	LT	0.28	LT	0.29	LT	0.29	LT	100

LT = Detected but Less Than Cited Limit of Quantitation Value.
ND = Not Detected at Cited Limit of Detection.
*Except Rinsate Units which are ug/L of water.

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were present at levels significantly above background in more than one sample. Above-background concentrations of the remaining metals were distributed between the shallow and deep samples. In general, the soil samples collected from both borings appear to have similar metal content and do not appear to differ greatly from each other. Although there are ten metals present at above-background levels, the concentrations and distribution found do not indicate that there has probably been significant migration of Nike-related wastes from the missile battery area to the FHU site.

The background values of several metals are high, in some cases higher than the concentrations reported in the soil boring samples, but these values fall within the expected range of concentrations for "average" soils in the eastern U.S. (Shacklette and Boerngen, 1984), as shown in Table 3.4.

In the semivolatile compounds category, as presented in Table 3.5, no organic compounds were detected at levels significantly above the limits of detection. This too indicates that no Nike-related wastes have migrated from the missile battery toward the FHU property. The screening parameters, total cyanide and total sulfide, were not detected at quantifiable concentrations in the boring samples or in the background sample.

3.4. CONCLUSIONS AND RECOMMENDATIONS

Based on the final laboratory data for the Clementon site, there is no conclusive evidence of contamination of the site by metals, volatile or semi-volatile organic compounds. Several metals were present in the samples at levels significantly higher than the background sample values. However, these levels were low and none of the levels appear to pose any degree of risk or present any environmental concern. No volatile or semi-volatile organic compounds were detected at quantifiable levels. Total cyanide and sulfide were not found in quantifiable amounts in any samples. The lack of significant differences between the soil samples collected from the utility trench and the background sample indicate that the FHU property probably has not been impacted by migration of hazardous materials from the Nike battery through the utility trench.

TABLE 3.4

RANGES OF ELEMENTS IN NATURAL SOILS
IN THE EASTERN UNITED STATES

ELEMENT	CONCENTRATION RANGE (ppm)
Aluminum (%)	0.7 - >10
Antimony	<1 - 8.8
Arsenic	0.1 - 73
Boron	20 - 150
Barium	10 - 1,500
Beryllium	<1 - 7
Calcium (%)	0.01 - 28
Cadmium	0.01 - 7
Chromium	1 - 1,000
Cobalt	<0.3 - 70
Copper	<1 - 700
Iron (%)	0.01 - >10
Lead	<10 - 300
Lithium	<5 - 140
Magnesium (%)	.005 - 5
Manganese	<2 - 7,000
Mercury	0.01 - 3.4
Nickel	<5 - 700
Potassium (%)	0.005 - 5
Selenium	<0.1 - 3.9
Silver	0.1 - 5
Sodium (%)	<0.05 - 5
Thallium	2.2 - 23
Vanadium	<7 - 300
Zinc	<5 - 2,900

References: Shacklette and Boerngen (1984), Element Concentrations in Soils and Other Surficial Materials of the Conterminous U.S., U.S. Geol. Surv. Prof. Paper 1270.

TABLE 3.5

ORGANIC COMPOUNDS DETECTED IN UTILITY TRENCH SAMPLES
CLEMENTON, NJ

(All values in ug/Kg of soil*)

SAMPLE ID	01-NJ-SUT-01-01	01-NJ-SUT-01-02	01-NJ-SUT-02-01	01-NJ-SUT-02-02	01-NJ-BKG-01	01-NJ SUT-RNS
Analysis						
VOCs	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
BNAs	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

*Except Rinsate Units are ug/L in water.

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SECTION 4. TRANSFORMER OILS

SECTION 4. TRANSFORMER OILS

WESTON personnel conducted a site visit at the Clementon facility on 27 February 1990 to evaluate the potential use of polychlorinated biphenyls (PCBs) in mixtures used for insulating existing transformers serving the facility. Following inspection of several properties where the condition of the transformers was poor, a protocol was developed to address problems that were being encountered during this activity. Due to the age and deteriorated condition of many of the transformers, collection of samples, in some cases, posed an undue risk of causing environmental damage or exacerbating any that may already exist. If the transformers could not be sampled safely, in the judgement of the field team leader, the planned sample collection was abandoned and any observations made by the field team were documented.

4.1. SAMPLING RATIONALE

Electrical transformers are often filled with a dielectric liquid which increases the resistance of the unit to arcing and also acts as a heat transfer medium to cool the coils. Many transformers are filled with a chlorinated fire-resistant fluid which meets the definition established in the National Electrical Code for "askarel", the generic name for non-flammable insulating liquids used in transformers. Prior to 1979, transformer askarel typically contained 60% to 100% PCBs. Askarel transformers were made in a variety of sizes containing from three to 3,000 gallons of PCB liquid.

Three types of transformers are defined in the regulations:

- PCB Transformer: Any transformer containing 500 ppm or greater PCBs.
- PCB-Contaminated Transformer: Any transformer containing 50-499 ppm PCBs.
- Non-PCB Transformer: Any transformer containing less than 50 ppm PCBs.

Sampling of transformers is conducted to verify which of these three categories of transformers are present. Depending upon the category determined, certain regulatory requirements including recordkeeping, marking, storage, and disposal must be satisfied.

In general, the sampling protocol followed by WESTON for this project was outlined in ANL's SAP. The plan identified sites where unlabeled, Army-owned transformers were thought to be present. The types, sizes, and precise locations of the transformers were not identified in the plan. Local utility company assistance was needed to identify ownership of the transformers and to provide services necessary to de-energize the high power lines prior to sampling. The objective of this task was to sample all Army-owned transformers serving the facility. However, it was agreed that if the sampling team determined that a spill that may result in environmental damage could occur due to the intrusive effort involved, sampling was not to be attempted. In such cases, name plate information and a general description of the transformer would be obtained. The following list presents potential conditions where sampling activities would not be attempted:

- Transformers are rusted and/or in very poor condition.

- Certain transformer hardware is in poor condition (i.e. drain valves, stopcocks, lid fastening bolts etc.)

- Transformers appear to be in good condition, but access is thwarted by bolts, wing nuts etc. that are "rusted shut".

- Transformer and/or transformer mounting pole ownership is questionable or is other than the U.S. Army.

4.2. SAMPLING METHODOLOGY AND OBSERVATIONS

Mr. Kevin Fulmer and Mr. Rick Evans of WESTON conducted the transformer sampling activities. Five Army-owned transformers were identified at the Clementon property. No personnel from the local utility company were needed for support and to de-energize the high-voltage power lines since the power supply lines to the facility had been disconnected. These transformers are mounted on three utility poles, one of which had three transformers. One utility pole is located next to Unit 306 with one affixed transformer, another is located next to Unit 318 with one affixed transformer, and three transformers are mounted on a utility pole at the end of the cul-de-sac.

Prior to sampling, WESTON personnel posted both the Health and Safety Plan and route to the nearest medical center at the facility. In addition, the sampling personnel donned appropriate protective equipment including latex booties, saranex suit, latex and nitrile gloves, and a hard hat with face shield.

All transformers were accessed using a 50-foot bucket truck. The sampling procedure included the removal of the transformer inspection plate, and collection of an oil sample. Upon removal of the transformer inspection plate, a tube was inserted into the transformer oil and internals. The liquid was agitated carefully, to avoid spilling any fluid onto the ground, for approximately five minutes, to ensure a homogeneous mixture of oil inside the transformer. A siphon bulb was then attached and manually operated to remove a sample of oil. Approximately 60 ml of sample from each transformer were placed in specially cleaned sample jars which were capped with Teflon®-lined lids. All sample jars were labeled with appropriate information and placed on ice in a cooler at a temperature of approximately 4°C. Dedicated samplers were used on each transformer to preclude cross-contamination. Finally, the transformer inspection plates were replaced after sampling.

4.3. LABORATORY PROCEDURES AND RESULTS

The samples were transported to WESTON Analytics Laboratory in Lionville, Pennsylvania for laboratory analysis. The oils were analyzed according to procedures described in 40 CFR Part 761. This involved sample preparation to remove potential oxygen-containing interferences and dilution to achieve PCB concentrations within the working range of the procedure. Gas chromatography with electron-capture detection of the PCB isomers was used to determine which PCB mixture, if any is in the oil and quantify the amount of each PCB mixture present. Table 4.1 presents a description of the sample number, the sample location, and the results of laboratory analyses. A copy of the laboratory reports for these samples is provided in Appendix C.2.

The sample results show that all transformers, except the center unit of the three mounted on the pole at the cul-de-sac, are classified as PCB contaminated. The center transformer on the cul-de-sac utility pole is classified as a non-PCB unit. In addition, the recoveries of all QC spikes was within the acceptability limits of the procedure, ranging from 90% to 104% recovery.

4.4. CONCLUSIONS AND RECOMMENDATIONS

The Clementon, New Jersey FHU property has been vacant since 1983 and has been extensively damaged by vandals. It appears that the buildings on this property will probably be demolished. The five PCB-contaminated transformers should be removed from the poles and disposed of in accordance with the applicable Federal regulations. If the site is reactivated, replacement transformers should be installed. No further action is required for the non-PCB transformer.

SECTION 5. SUMMARY OF FINDINGS

SECTION 5. SUMMARY OF FINDINGS

Sampling and analyses performed at the Clementon, New Jersey FHU reveal the existence of certain issues of concern from an environmental standpoint. These include the presence of asbestos-containing materials as components in the structures, the somewhat elevated (above background) concentrations of six metals in soil samples collected of the utility trench, and the presence of PCB-containing transformers.

Insulation on pipes and fittings and vinyl floor tile were the only suspect materials sampled during the visual examination of three of the 24 housing units at the facility. Dust within the heating ductwork of this facility was not sampled due to the conditions and amount of debris present in the units. Several different types and colors of vinyl floor tile were observed and sampled. These floor tiles were generally in poor condition, due to the amount of vandalism that had occurred. Since it is possible that these units will be demolished, most of the ACM must be removed before demolition to comply with the NESHAP.

Analytical results indicate that both material types contain asbestos. All six of the samples of pipe insulation and all eight vinyl floor tile samples contained asbestos, although the asbestos in one sample could not be observed by PLM as discussed previously, but was detected by TEM analysis.

The friable asbestos-containing pipe insulation and the debris presumed to contain asbestos should be removed from the facilities before they are renovated, disposed of, or demolished. The condition of these materials has deteriorated to the point that repairs are not thought to be a viable option. Some of the non-friable floor tiles may be repaired and managed under an O&M plan until they are ultimately removed from the facilities. The debris scattered throughout the facilities should also be cleaned up, using proper procedures for removal of asbestos debris, while the units are vacant. The debris appears to contain significant quantities of friable asbestos-containing pipe insulation, and may pose a health risk if not addressed.

Further studies, such as air sampling, were recommended at other facilities to determine if asbestos is becoming airborne and to define what risks, if any, are presented by those findings. These studies could not be performed at this facility as a part of the follow-up effort because of the vandalism and the fact that electrical power was not available to operate the heating systems.

The results of laboratory analyses performed on the utility trench samples indicate that there are no significant contaminants in this area. The levels of six metals, including arsenic, chromium, nickel, silver, tin, and vanadium detected in some of the soil samples were somewhat higher than those found in the background samples, but no level was sufficiently high to pose a significant risk to persons occupying the facility or to the environment. Neither sulfide nor cyanide were detected in quantifiable amounts in any samples. The results for volatile and semi-volatile organic compounds do not indicate the presence of significant levels of contamination by residues from Nike wastes. There appears to be no environmentally significant difference between the results obtained for the background sample and those soil samples taken from the utility trench.

Five Army-owned transformers were identified on the Clementon property. Samples of the insulating oils were collected and analyzed by the WESTON laboratory. Four of the five transformers were determined to contain PCBs in excess of 50 ppm. These transformers should be removed and transported to a secure location where the oils can be safely drained. Both the oils and transformers should be disposed of in accordance with State and Federal regulations.

APPENDIX A.1. FIELD DATA, ASBESTOS SAMPLING

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01

FACILITY/BLDG. NO. Clementon NJ FHU #320

FACILITY CONTACT Mike Prino TELEPHONE NUMBER 659-562-5198

TECHNICIAN NAME L. Jaye SIGNATURE Nolan L Jaye Jr.

TECHNICIAN NAME A. Busby SIGNATURE Arthur M. Busby

TIME ARRIVED 1400 TIME DEPARTED 1430 DATE 19 /FEB/90
dd mmm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

All units at this site have been vacant since 1985. Extensive vandalism and destruction has taken place. We were unescorted into this area. Houses are 2-3 bedroom with vinyl siding. No dust samples were taken due to debris filling and covering most floor vents. Most heaters & hot water units have been torn out. Some loose pipe insulation (laying on floor) stripped off piping was sampled. Various floor tiles were also sampled.

ALL of the duct work is Galvanized pipe encapsulated in the cement slab floor. Some heating units that were still in place had expansion joints that were made of cotton canvas. In some of the units, all of the walls and ceilings had been ripped out so we could see that there was fiber glass insulation in the ceilings and the outside walls.

(Cont.)

ACTIVITY CHECKLIST

Interviews Completed N/A

Number of Samples 5

Drawings Reviewed N/A

Survey Form Completed ✓

Drawings Attached ✓

Site Log Completed ✓

Visual Inspection ✓

Chain-of-Custody Initiated ✓

Number of Photos ~~3~~ 4 1

Exp. Assess. Form Init. ✓

Q.A. Check ____ SIGNATURE ____________ DATE / /90
dd mmm yy

M:\ADMNFORM\SSL.frm

WESTON

0482

SITE SURVEY LOG

(Continued)

There is no insulation in the walls between the bedrooms, Kitchen, bathroom, etc...

There is wood underneith the insulation under the ~~g~~ vinyl siding. No transite was present.

There was no evidence of more than one layer of floor tile in any of the units.

We walked through all of the units at this site and decided to sample both a 2 bedroom & 3 bedroom unit. We chose the buildings that were more intact and may have been more representative of the homes before they were abandoned.

None of the water pipes are located ~~in~~ above the ceilings in these units. The water pipes were located in the walls by the kitchen sink and bathroom fixtures, but most of the insulation had been ripped out and was in very poor condition and scattered all over the floors.

All of the roofs on these units are constructed of asphalt & gravel.

There was no evidence of Asbestos inside of the furnace itself. Many of the units had been broken open and we were able to examine the interior of them.

ASBESTOS SURVEY DATA

0483

BLDG. NO.: 3 2 0
INSTALLATION 0 0 1

TASK TEAM MEMBERS
L. Jaye
A. Busby

W.O. No. 2104-13-01
CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Clementon FHU #320
BLDG. DESCRIPTION: 3-bedroom, vinyl siding

DATE (dd/mm/yy): 19/Feb/90
TIME ARRIVED: 1400

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	BY1178	01	NJ	320	AFT	KITCHEN	210		10771A	01
2.	BY1179	01	NJ	320	AFT	BEDROOM	695		10771B	02
3.	BY1180	01	NJ	320	API	KITCHEN	130	✓	10771C	03
4.	BY1181	01	NJ	320	API	KITCHEN	[illegible]		10771C	04
5.	BY1182	01	NJ	320	API	KITCHEN	[illegible]		10771C	04
6.					A					
7.					A					
8.					A					
9.					A					
10.					A					
11.					A					
12.					A					

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Vinyl flooring in kitchen & bathrooms (square feet)
02	12X12 Brown floor tile all bedrooms, LR, halls (square feet)
03	Pipe insulation (stripped off pipes) Linear feet
04	Same material as sample BY 180

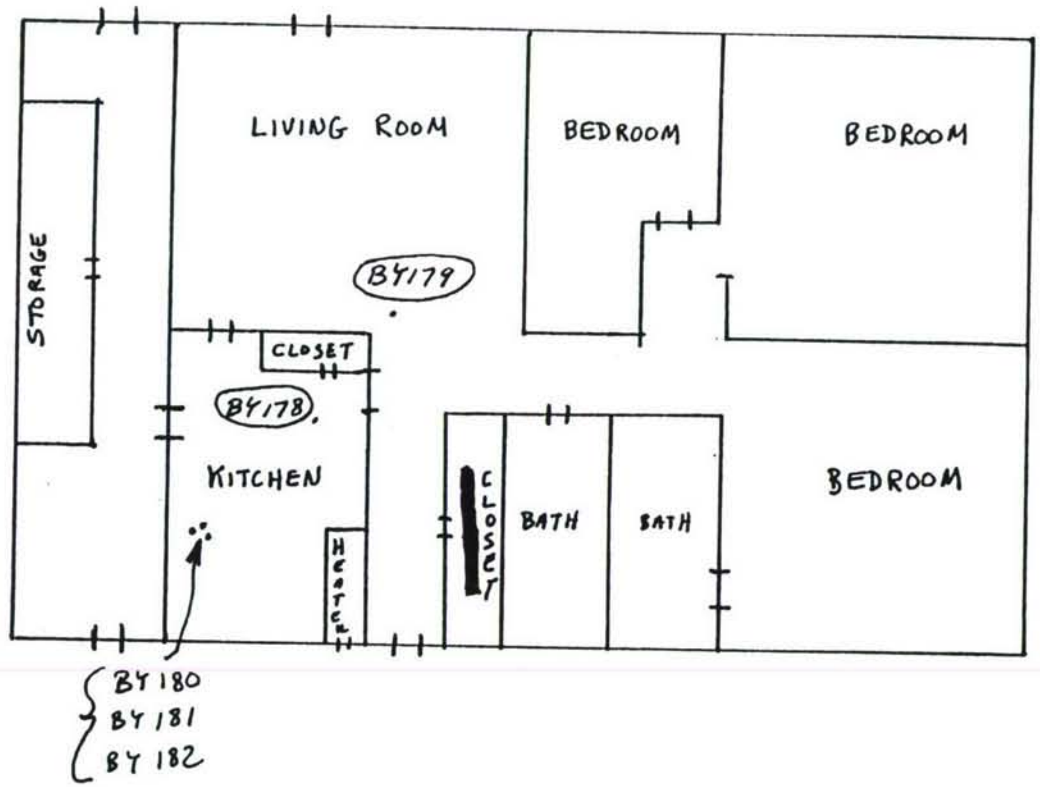
TECHNICIAN SIGNATURE [signature]

QUALITY ASSURANCE SIGNATURE

ASDAPCON 2-90

ROY F. WESTON, INC.

CLEMENTON FHY # 320



3- BEDROOM CLEMENTON FHY.

001

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01

FACILITY/BLDG. NO. Clementon FHU # 324

FACILITY CONTACT Mike Prino TELEPHONE NUMBER 659-562-5198

TECHNICIAN NAME L. Jaye SIGNATURE Nolan L. Jaye

TECHNICIAN NAME A. Busby SIGNATURE Arthur M. Busby

TIME ARRIVED 1430 TIME DEPARTED 1500 DATE 19 / FEB / 90
dd mmm yy

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

This unit is a 2-bedroom house with vinyl siding. Much vandalism (walls, floors, windows - debris covering floors). We took no dust samples as floor vents were covered with debris. No pipe insulation noted. Four diffent colors of floor tile were sampled.

Most of the walls and ceilings have been torn down and all of the bathroom fixtures have been smashed. There is nothing in the kithen such as stove and refrigerator or sink. The area is dangerous to work in because of the broken glass, nails broken ceramic fixtures junk hanging from the ceilings.

ACTIVITY CHECKLIST

Interviews Completed n/A

Drawings Reviewed n/A

Drawings Attached ✓

Visual Inspection ✓

Number of Photos 0

Number of Samples 4

Survey Form Completed ✓

Site Log Completed ✓

Chain-of-Custody Initiated ✓

Exp. Assess. Form Init. ✓

Q.A. Check ____ SIGNATURE ____________ DATE __ / __ /90
dd mmm yy

WESTON

ASBESTOS SURVEY DATA

0487

BLDG. NO.: 324
INSTALLATION 001

TASK TEAM MEMBERS
L. Jaye
A. Busby

W.O. No. 2104-13-01
CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Clementon FHU #324
BLDG. DESCRIPTION: 2-bedroom, vinyl siding

DATE (dd/mm/yy): 19/FEB/90
TIME ARRIVED: 1430

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	B41183	01	NJ	324	AFT	LIVING ROOM	270	_	L0781A	01
2.	B41184	01	NJ	324	AFT	LIVING ROOM	270	_	L0781B	02
3.	B41185	01	NJ	324	AFT	KITCHEN	110	_	L0781C	03
4.	B41186	01	NJ	324	AFT	KITCHEN	1145	_	L0781D	04
5.					A			_		
6.					A			_		
7.					A			_		
8.					A			_		
9.					A			_		
10.					A			_		
11.					A			_		
12.					A			_		

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Tan 9x9 floor tile in LR, BR's (square feet)
02	Black 9x9 floor tile in LR, BR's (square feet)
03	Red 9x9 floor tile (patched section in kitchen) sq. ft.
04	Black 12x12 floor tile (sq ft)
	01 & 02 are laid in a checkered pattern in most of the house. There has been alot of water damage and most of the tiles are loose.

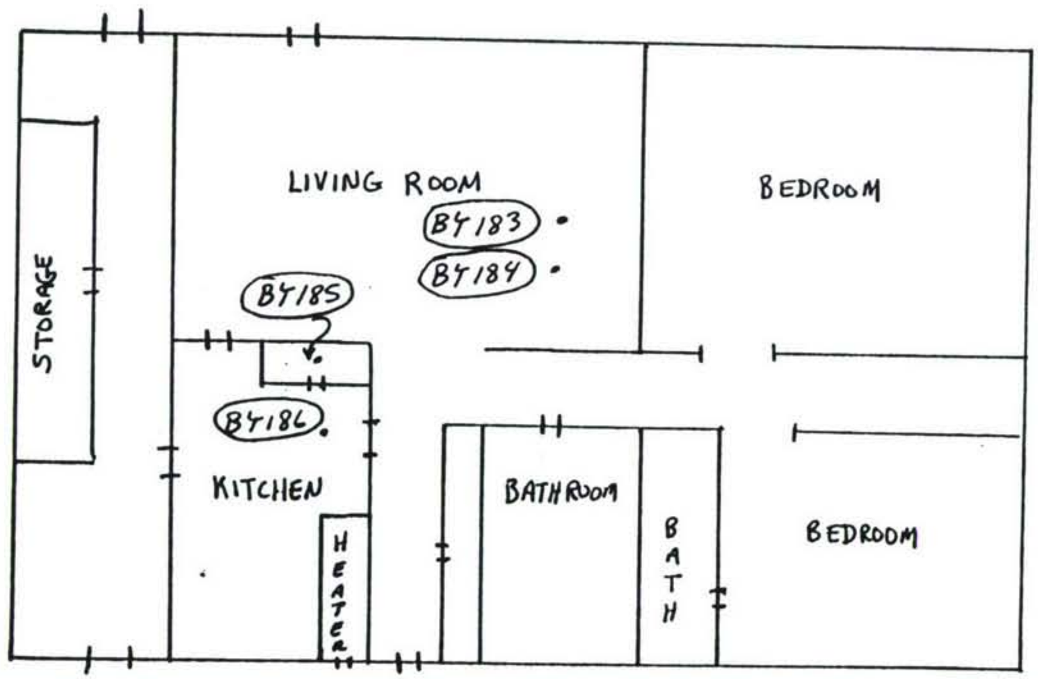
TECHNICIAN SIGNATURE [signature]

QUALITY ASSURANCE SIGNATURE

ASDARGON 2-90

ROY F. WESTON, INC.

CLEMENTON FHU # 324



2- BEDROOM CLEMENTON FHU.

001

SITE SURVEY LOG

CLIENT Argonne National Labs WESTON WORK ORDER NO. 2104-13-01

FACILITY/BLDG. NO. Clementon FHU # 311

FACILITY CONTACT Mike Prino TELEPHONE NUMBER 659-562-5198

TECHNICIAN NAME L. Jaye SIGNATURE Alden L Jaye

TECHNICIAN NAME A. Busby SIGNATURE Arthur A. Busby

TIME ARRIVED 1500 TIME DEPARTED 1530 DATE 19 FEB/90 (dd mmm yy)

SPECIFIC SITE ACTIVITIES, COMMENTS, INTERVIEW RESULTS & BRIEF DESCRIPTION OF FACILITY

This unit is a 3-bedroom house with vinyl siding. Extensive damage throughout the house. No dust Samples taken. Loose pipe insulation off pipes in Kitchen were sampled. Two types of floor tile Sampled.

ACTIVITY CHECKLIST

Interviews Completed	N/A	Number of Samples	5
Drawings Reviewed	N/A	Survey Form Completed	✓
Drawings Attached	✓	Site Log Completed	✓
Visual Inspection	✓	Chain-of-Custody Initiated	✓
Number of Photos	1	Exp. Assess. Form Init.	✓

Q.A. Check ____ SIGNATURE ____________ DATE __/__/90 (dd mmm yy)

ASBESTOS SURVEY DATA

0491

BLDG. NO.: 3111
INSTALLATION 0101

TASK TEAM MEMBERS
L. Jaye
A. Busby

W.O. No. 2104-13-01
CLIENT: ARGONNE NATIONAL LAB

BLDG. NAME: Clementon FHU #311
BLDG. DESCRIPTION: 3-bedroom, vinyl siding

DATE (dd/mm/yy): 19/FEB/90
TIME ARRIVED: 1500

ITEM NO.	LAB SAMPLE NO.	BASE NO.	STATE	UNIT NO.	SAMPLE CODE	AREA	QUANTITY	PHOTO	E.A. FORM NO.	NOTES
1.	BY1187	01	NJ	3111	AFT	BEDROOM	605		1079A	01
2.	BY1188	01	NJ	3111	AFT	KITCHEN	210		1079B	02
3.	BY1189	01	NJ	3111	API	KITCHEN	139		1079C	03
4.	BY1190	01	NJ	3111	API	KITCHEN		✓	1079C	04
5.	BY1191	01	NJ	3111	API	KITCHEN			1079C	04
6.					A					
7.					A					
8.					A					
9.					A					
10.					A					
11.					A					
12.					A					

NOTE NO.	NOTES/REMARKS/COMMENTS/DETAILS/OTHER MATERIALS, QUANTITY, ETC.
01	Brown 12x12 Floor tile all 3 br's & Living room (square feet)
02	White 12x12 floor tile in kitchen & bathroom (square feet)
03	Pipe insulation - loose on floor (Linear feet)
04	Same material as BY189.

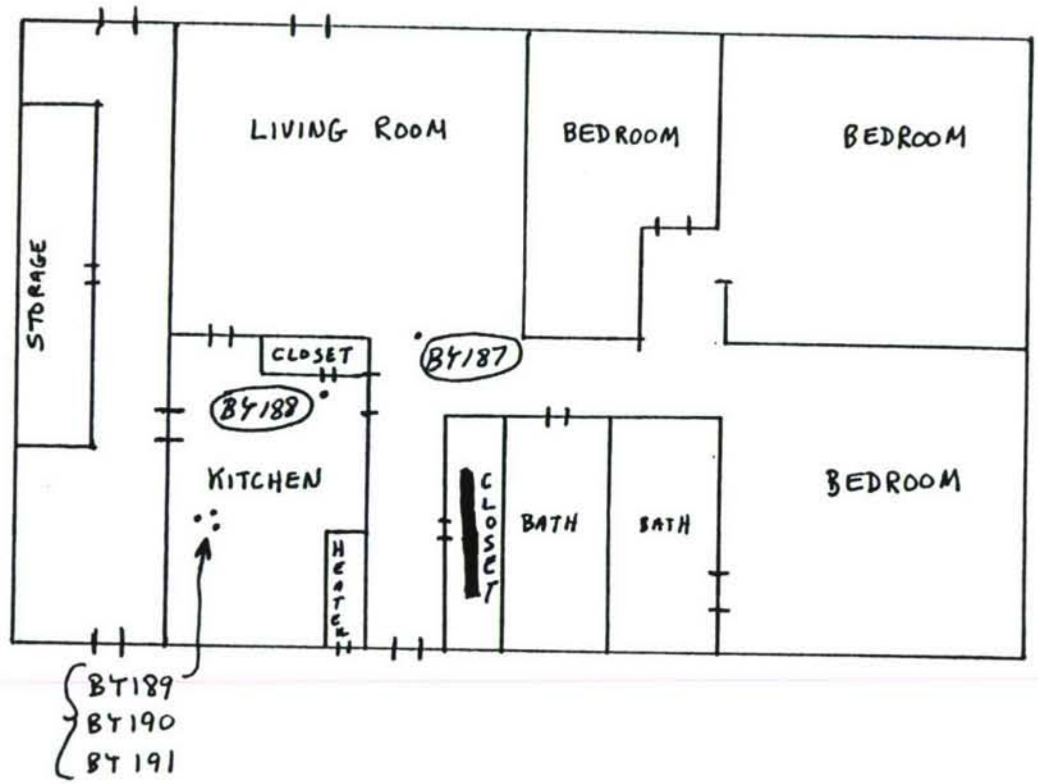
TECHNICIAN SIGNATURE John L Jaye

QUALITY ASSURANCE SIGNATURE

ASDARGON 2-90

ROY F. WESTON, INC.

CLEMENTON FHY # 311



3- BEDROOM CLEMENTON FHY.

001

APPENDIX A.2. LABORATORY DATA, ASBESTOS SAMPLES

BULK SAMPLE ANALYSIS SUMMARY

Weston W.O. No. 2104-13-01-0000

Sample Number BY178 through Sample BY191

AO LAB ID NO	CLIENT/CLIENT ID	LOCATION	MATERIAL DESCRIPTION *	DATE RECEIVED	RESULTS ** CH	AM	CR	OT	TL	LAYERS	ANALYST
BY178	01-NJ-320-AFT	KITCHN	NF, VINYL FLR	02/23/90	35	ND	ND	ND	35	Yes	06071
BY179	01-NJ-320-AFT	BEDRM	NF, BR, 12X12 FT	02/23/90	5	ND	ND	ND	5	No	06071
BY180	01-NJ-320-API	KITCHN	F, PIPE INSUL	02/23/90	15	ND	ND	ND	15	Yes	06071
BY181	01-NJ-320-API	KITCHN	F, PIPE INSUL	02/23/90	20	ND	ND	ND	20	Yes	06071
BY182	01-NJ-320-API	KITCHN	F, PIPE INSUL	02/23/90	15	ND	ND	ND	15	Yes	06071
BY183	01-NJ-324-AFT	LIVNRM	NF, TN, 9X9 FT	02/23/90	15	ND	ND	ND	15	Yes	06071
BY184	01-NJ-324-AFT	LIVNRM	NF, BK, 9X9 FT	02/23/90	10	ND	ND	ND	10	No	06071
BY185	01-NJ-324-AFT	KITCHN	NF, RD, 9X9 FT	02/23/90	3	ND	ND	ND	3	No	06806
BY186	01-NJ-324-AFT	KITCHN	NF, BK, 12X12 FT	02/23/90	1	ND	ND	ND	1	No	06806
BY187	01-NJ-311-AFT	BEDRM	NF, BR, 12X12 FT	02/23/90	ND	ND	ND	ND	ND	No	06806
BY188	01-NJ-311-AFT	KITCHN	NF, WH, 12X12 FT	02/23/90	1	ND	ND	ND	1	No	06806
BY189	01-NJ-311-API	KITCHN	F, PIPE INSUL	02/23/90	5	ND	ND	ND	5	Yes	06806
BY190	01-NJ-311-API	KITCHN	F, PIPE INSUL	02/23/90	5	ND	ND	ND	5	Yes	06806
BY191	01-NJ-311-API	KITCHN	F, PIPE INSUL	02/23/90	2	ND	ND	ND	2	Yes	06806

* MATERIAL DESCRIPTION

Friable[1], Color[2], System[3], Type

** RESULTS

CH - Chrysotile
AM - Amosite
CR - Crocidolite
OT - Other
TL - Total

FRIABLE[1]

F - Friable
NF - Non-Friable

COLOR[2]

BK - Black
BL - Blue
BR - Brown
GR - Green
GY - Gray
RD - Red
TN - Tan
WH - White
YL - Yellow

SYSTEM[3]

CHW - Chilled Water
DOM - Domestic Water
HHW - Heating Hot Water
STM - Steam
UNK - Unknown

Upon issue, this report may be reproduced only in full.
All analyses are performed in accordance with the methods set forth in U.S. EPA 600/M4-82-020, as ammended. Weston's Optical Microscopy Laboratory is accredited by the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program for asbestos fiber analysis (Laboratory Code 1254).

ROY F. WESTON, INC.
1635 PUMPHREY AVE.
AUBURN, AL 36830
PHONE: (205) 826-6100
FAX: (205) 826-8232

MANAGERS DESIGNERS/CONSULTANTS

Transmission Electron Microscopy
Asbestos Summary Report

Client: Argonne National Laboratories   Weston W.O. No.: 2104-13-01-0000

Sample Type: Floor Tiles   Sampling Location: Clementon

QUALITATIVE ANALYSIS

FLOOR TILES: A 0.5 to 2.0 gram portion of each floor tile sample was ultrasonically disaggregated in four milliliters of deionized, 0.2 μm membrane filtered water. After the coarse fraction settled, a drop of the suspended, clay-sized fraction was placed on a Formvar coated 200 mesh Cu TEM grid and allowed to dry. The grid was carbon coated for thermal stability in the electron beam and examined with a Philips CM12 transmission electron microscope operating at 120 kilovolts accelerating voltage.

ANALYTICAL RESULTS

SAMPLE IDENTIFICATION	RESULTS
BY187-01-NJ-311-AFT	Positive

Greg Hall
(Approved for Transmittal)

3/21/90
(Date)

* This test report relates only to the specific items tested.
** These sample results may only be reproduced in full, and are valid only if approved for transmittal.

APPENDIX B.1. FIELD LOGS, NIKE WASTE SAMPLING

(16)

HOLMDEL REF NO. 9009719

PHONE LINES - WILL MARK 3-1-10

CLEMENTON REF NO. 9009704

D.E.H. CLEARED

SITE ABANDONED, ALL SERVICES CUT OFF

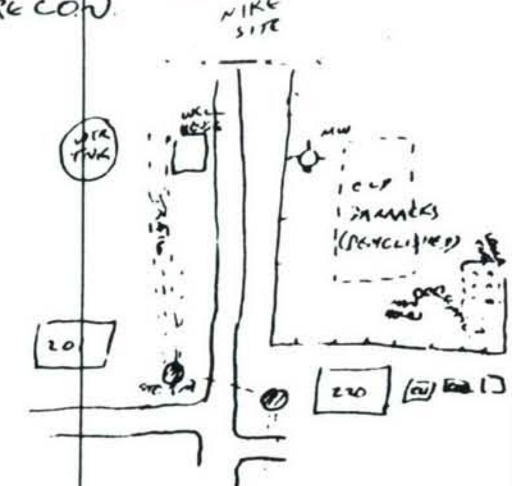
28 FEB 90

M. ESCHBACHER (17)

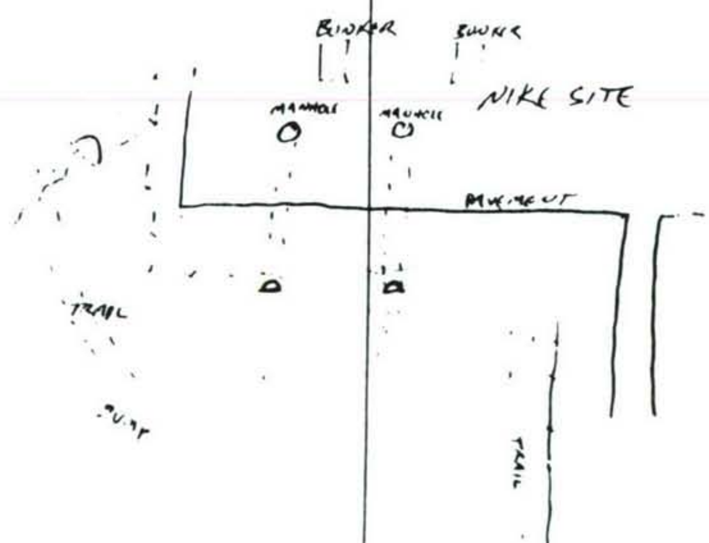
FRANKLIN LAKES RECON

ARR 1105

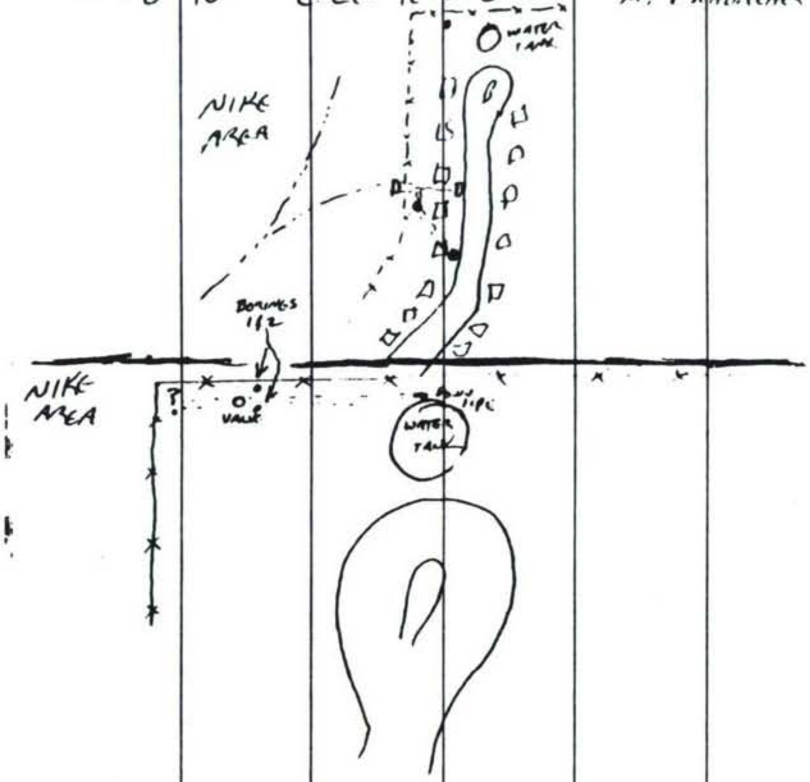
DEP 1245



MIKE PRINO - "NO CONNECTION BETWEEN NIKE & WATER SUPPLY AREA."



2-28-90 CLEMENTON M. ESCHBACHER



1815 ARRIVE ON SITE, SOON LOCATE TWO SEWER MANHOLES, SEWAGE APPEARS AS THOUGH IT MAY BE SIMPLY STORM DRAINAGE BUT I'M NOT SURE. IN MANHOLES IT IS ONLY AN OPEN TRENCH, NOT CLOSED PIPE. DEFFINATELY GRAVITY FEED PRECLUDING ANY CONNECTION TO NIKE SITE DUE TO AN INTERVENING DRAINAGE.

2-28-90

CLEMENTON

AT TOP OF HILL IS A WATER TANK. THE DOWN-PIPE AND A NEARBY VALVE APPEAR TO BE CONNECTED. ALTHOUGH I AM NOT CERTAIN, IT APPEARS THAT THE WATER LINE PROBABLY GOES OFFSITE TO THE NIKE AREA. WILL PLACE TWO BORINGS NEAR WATER VALVE IN THE DIRECTION OF THE TANK SINCE IT IS THE ONLY PLACE I'M CERTAIN OF THE UTILITY LOCATION.

ME

CLEMENTON

M. ESCHBACHER

3-6-90 SB-1 35° LT. RAIN

	REC	HNU		
0-2	1.3	BKG	2-3-3-5	0-0.5 MED BROWN, LOAMY, SILTY SAND, F-CRS GR.; 0.5-1.3 YEL-BROWN, MED G.R.S.CR., SOME SILT & CLAY, TR GRAV.
	RAIN BEGINS, HNU DIED			
2-4	0.9	OUT	3-5-7-9	ORANGE RED SANDY CLAY, MOIST, PLAST. TR GRAVEL, TR. PEB
4-6	1.2	-	6-9-8-5	SAME
6-8	1.1	-	4-8-8-13	SAME W/ SOME GRAVEL
8-10	1.4	-	8-9-12-11	SAME, GRAVELLY, REP-B...

SAMPLE #1 01-NJ-319-SUT-01-01 8-4' ~~2-6~~

SAMPLE #2 01-NJ-319-SUT-01-02 6-10

M. ESCHBACHER

3-6-90 SB 2 35° LT RAIN

	REC	HNU	BLOWS	
0-2	1.3	—	2-3-9-7	MED BROWN, GRAVLY, SILTY SAND, F-CRS GR. MOIST 1 INCH LOAM AT TOP.
2-4	1.4	—	2-3-3-6	MED BROWN, F-MED GR. SAND, WET, TR GRAV. TR. CLAY
4-6	1.4		6-7-9-9	0-0.6 SAME; 0.6-1.4 ORANGE RD, GRVLY SAND, SOME ~~...~~ CLAY
6-8	1.3		7-9-9-6	SAME, TR. CLAY
8-10	1.4		7-8-7-10	SAME, SANDY GRAVEL

SAMPLE #1 01-NJ-319-SUT-02-01, 0-4'

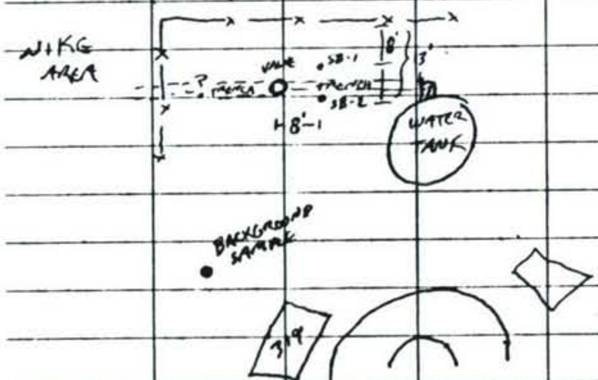
SAMPLE #2 01-NJ-319-SUT-02-02, 4-8'

(34) 3-6-90 CLEMENTON M. ESCHBACHER
35° LT. RAIN

0815 ARRIVE ON SITE DRILLERS ALREADY ON LOCATION. PREP TO DRILL

0830 BEGIN DRIVING SPOONS FOR SOIL BORING #1. NO NEED TO USE AUGERS, HOLE HOLDING UP NICELY. HOLE BORED NEAR WATER VALVE AT LOCATION CHOSEN DURING PREVIOUS RECON OF SITE. (SEE FOLLOWING SKETCH).

SEE PG. 30 FOR LOG



0900 FINISH BORING #1. DECON EQUIP W/ ALCONOX AND DI. RINSE.

0930 BEGIN BORING #2 USING SPLIT SPOONS ONLY. SEE PG 31 FOR LOG

1000 FINISH BORING #2, DRILLERS CLEAN & PACK UP, BORINGS FILLED W/ BENT. I TAKE BACKGROUND SAMPLE FROM YARD BEHIND UNIT 319

APPENDIX B.2. LABORATORY DATA, NIKE WASTE SAMPLES

DATA QUALIFIERS
ARTHUR D. LITTLE LABORATORY REPORTS
(From USATHAMA Laboratory Handbook)

Measurement Boolean

ND - Not Detected.

LT - Less Than.

GT - Greater Than.

Flagging Codes

_ - No Meaning.

C - Analysis Involves Litigation and Confirmed.

U - Analysis Involves Litigation and Unconfirmed.

S - Results Bases on Internal Standard.

R - Analyte Required for Reporting Purposed, but Not Certified.

D - Duplicate Sample or Test Name.

G - Analysis Done With, but Unsure Quantitation, Due to Background or Interferences Present.

Units Meas

UGG = micrograms per gram

CHEMICAL REPORT
Installation: NIKE PHILA 41/43(CLEMNTN) NJ (J1)
Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990
* Non-detected Compounds Included *
Minimum: X: 499840 Y: 4399910
Maximum: X: 499880 Y: 4399940

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	BKG	99	123TCB	06-mar-1990	LT	0.290	UGG
		99	124TCB	06-mar-1990	LT	0.290	UGG
		99	12DCLB	06-mar-1990	LT	0.330	UGG
		99	13DCLB	06-mar-1990	LT	0.330	UGG
		99	14DCLB	06-mar-1990	LT	0.320	UGG
		99	245TCP	06-mar-1990	ND	1.700	UGG
		99	246TCP	06-mar-1990	ND	1.700	UGG
		99	24DCLP	06-mar-1990	ND	0.330	UGG
		99	24DMPN	06-mar-1990	ND	0.330	UGG
		99	24DNP	06-mar-1990	ND	1.700	UGG
		99	24DNT	06-mar-1990	LT	0.390	UGG
		99	26DNT	06-mar-1990	LT	0.530	UGG
		99	2CLP	06-mar-1990	ND	0.330	UGG
		99	2CNAP	06-mar-1990	LT	0.320	UGG
		99	2MNAP	06-mar-1990	ND	0.330	UGG
		99	2MP	06-mar-1990	ND	0.330	UGG
		99	2NANIL	06-mar-1990	ND	1.700	UGG
		99	2NP	06-mar-1990	ND	0.330	UGG
		99	33DCBD	06-mar-1990	ND	0.200	UGG
		99	3NANIL	06-mar-1990	ND	1.700	UGG
		99	46DN2C	06-mar-1990	ND	1.700	UGG
		99	4BRPPE	06-mar-1990	ND	0.330	UGG
		99	4CANIL	06-mar-1990	ND	0.330	UGG
		99	4CL3C	06-mar-1990	ND	0.330	UGG
		99	4CLPPE	06-mar-1990	ND	0.330	UGG
		99	4MP	06-mar-1990	ND	0.330	UGG
		99	4NANIL	06-mar-1990	ND	1.700	UGG
		99	4NP	06-mar-1990	ND	1.700	UGG
		99	ABHC	06-mar-1990	LT	0.460	UGG
		99	ACLDAN	06-mar-1990	ND	1.000	UGG
		99	AENSLF	06-mar-1990	ND	0.100	UGG
		99	AG	06-mar-1990		0.050	UGG
		99	ALDRN	06-mar-1990	LT	0.290	UGG
		99	ANAPNE	06-mar-1990	LT	0.410	UGG
		99	ANAPYL	06-mar-1990	LT	0.460	UGG
		99	ANTRC	06-mar-1990	LT	0.540	UGG
		99	B2CEXM	06-mar-1990	ND	0.330	UGG
		99	B2CIPE	06-mar-1990	ND	0.330	UGG
		99	B2CLEE	06-mar-1990	LT	0.330	UGG
		99	B2EHP	06-mar-1990	LT	0.390	UGG
		99	BAANTR	06-mar-1990	LT	0.300	UGG
		99	BAPYR	06-mar-1990	LT	0.380	UGG
		99	BBFANT	06-mar-1990	LT	0.360	UGG
		99	BBHC	06-mar-1990	LT	0.360	UGG
		99	BBZP	06-mar-1990	ND	0.330	UGG
		99	BENSLF	06-mar-1990	ND	0.200	UGG
		99	BENZOA	06-mar-1990	ND	1.700	UGG

CHEMICAL REPORT
Installation: NIKE PHILA 41/43(CLEMNTN) NJ (J1)
Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	BKG	99	BGHIPY	06-mar-1990	LT	0.240	UGG
		99	BKFANT	06-mar-1990	LT	0.800	UGG
		99	BZALC	06-mar-1990	ND	0.330	UGG
		99	CHRY	06-mar-1990	LT	0.450	UGG
		99	CL6BZ	06-mar-1990	LT	0.260	UGG
		99	CL6CP	06-mar-1990	ND	0.330	UGG
		99	CL6ET	06-mar-1990	LT	0.400	UGG
		99	CLDAN	06-mar-1990	ND	0.330	UGG
		99	CPMS	06-mar-1990	LT	0.370	UGG
		99	CPMSO	06-mar-1990	LT	0.270	UGG
		99	CPMSO2	06-mar-1990	LT	0.690	UGG
		99	DBAHA	06-mar-1990	LT	0.200	UGG
		99	DBHC	06-mar-1990	LT	0.290	UGG
		99	DBZFUR	06-mar-1990	ND	0.330	UGG
		99	DEP	06-mar-1990	ND	0.330	UGG
		99	DITH	06-mar-1990	LT	0.240	UGG
		99	DLDRN	06-mar-1990	LT	0.300	UGG
		99	DMP	06-mar-1990	ND	0.330	UGG
		99	DNBP	06-mar-1990	ND	0.330	UGG
		99	DNOP	06-mar-1990	LT	0.590	UGG
		99	ENDRN	06-mar-1990	LT	0.410	UGG
		99	ENDRNK	06-mar-1990	ND	0.200	UGG
		99	ESFSO4	06-mar-1990	ND	0.200	UGG
		99	FANT	06-mar-1990	LT	0.520	UGG
		99	FLRENE	06-mar-1990	ND	0.330	UGG
		99	HCBD	06-mar-1990	LT	0.420	UGG
		99	HPCL	06-mar-1990	LT	0.280	UGG
		99	HPCLE	06-mar-1990	LT	0.360	UGG
		99	ICDPYR	06-mar-1990	LT	0.210	UGG
		99	ISOPHR	06-mar-1990	ND	0.330	UGG
		99	LIN	06-mar-1990	LT	0.430	UGG
		99	MEXCLR	06-mar-1990	ND	1.000	UGG
		99	MLTHN	06-mar-1990	LT	0.480	UGG
		99	NAP	06-mar-1990	LT	0.420	UGG
		99	NB	06-mar-1990	ND	0.330	UGG
		99	NDNPA	06-mar-1990	LT	0.360	UGG
		99	NNDPA	06-mar-1990	ND	0.330	UGG
		99	OXAT	06-mar-1990	LT	0.250	UGG
		99	PB	06-mar-1990		93.750	UGG
		99	PCP	06-mar-1990	ND	1.700	UGG
		99	PHANTR	06-mar-1990	LT	0.410	UGG
		99	PHENOL	06-mar-1990	ND	0.330	UGG
		99	PPDDD	06-mar-1990	LT	0.180	UGG
		99	PPDDE	06-mar-1990	LT	0.220	UGG
		99	PPDDT	06-mar-1990	LT	0.410	UGG
		99	PRTHN	06-mar-1990	LT	0.460	UGG
		99	PYR	06-mar-1990	LT	0.420	UGG
		99	SE	06-mar-1990	ND	4.100	UGG
		99	SN	30-may-1990	LT	100.000	UGL
		99	SULFID	06-mar-1990	LT	0.290	UGG

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Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	BKG	JB03	HG	06-mar-1990		0.000	UGG
		JD13	AS	06-mar-1990		7.900	UGG
		JS10	AL	06-mar-1990		5387.900	UGG
		JS10	BA	06-mar-1990		14.000	UGG
		JS10	BE	06-mar-1990	LT	0.100	UGG
		JS10	CA	06-mar-1990		677.400	UGG
		JS10	CD	06-mar-1990	LT	2.000	UGG
		JS10	CO	06-mar-1990	LT	2.400	UGG
		JS10	CR	06-mar-1990		5.100	UGG
		JS10	CU	06-mar-1990		4.600	UGG
		JS10	FE	06-mar-1990		4698.400	UGG
		JS10	K	06-mar-1990		231.500	UGG
		JS10	MG	06-mar-1990		180.200	UGG
		JS10	MN	06-mar-1990		15.700	UGG
		JS10	NA	06-mar-1990	LT	40.200	UGG
		JS10	NI	06-mar-1990		1.600	UGG
		JS10	SB	06-mar-1990	LT	4.300	UGG
		JS10	TL	06-mar-1990	LT	2.800	UGG
		JS10	V	06-mar-1990	LT	4.700	UGG
		JS10	ZN	06-mar-1990		23.400	UGG
		KY05	CYN	06-mar-1990	LT	0.600	UGG
BORE	SUT-01-01	99	123TCB	06-mar-1990	LT	0.290	UGG
		99	124TCB	06-mar-1990	LT	0.290	UGG
		99	12DCLB	06-mar-1990	LT	0.330	UGG
		99	13DCLB	06-mar-1990	LT	0.330	UGG
		99	14DCLB	06-mar-1990	LT	0.320	UGG
		99	245TCP	06-mar-1990	ND	1.700	UGG
		99	246TCP	06-mar-1990	ND	1.700	UGG
		99	24DCLP	06-mar-1990	ND	0.330	UGG
		99	24DMPN	06-mar-1990	ND	0.330	UGG
		99	24DNP	06-mar-1990	ND	1.700	UGG
		99	24DNT	06-mar-1990	LT	0.390	UGG
		99	26DNT	06-mar-1990	LT	0.530	UGG
		99	2CLP	06-mar-1990	ND	0.330	UGG
		99	2CNAP	06-mar-1990	LT	0.320	UGG
		99	2MNAP	06-mar-1990	ND	0.330	UGG
		99	2MP	06-mar-1990	ND	0.330	UGG
		99	2NANIL	06-mar-1990	ND	1.700	UGG
		99	2NP	06-mar-1990	ND	0.330	UGG
		99	33DCBD	06-mar-1990	ND	0.200	UGG
		99	3NANIL	06-mar-1990	ND	1.700	UGG
		99	46DN2C	06-mar-1990	ND	1.700	UGG
		99	4BRPPE	06-mar-1990	ND	0.330	UGG
		99	4CANIL	06-mar-1990	ND	0.330	UGG
		99	4CL3C	06-mar-1990	ND	0.330	UGG
		99	4CLPPE	06-mar-1990	ND	0.330	UGG
		99	4MP	06-mar-1990	ND	0.330	UGG

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Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-01-01	99	4NANIL	06-mar-1990	ND	1.700	UGG
		99	4NP	06-mar-1990	ND	1.700	UGG
		99	ABHC	06-mar-1990	LT	0.460	UGG
		99	ACLDAN	06-mar-1990	ND	1.000	UGG
		99	AENSLF	06-mar-1990	ND	0.100	UGG
		99	AG	06-mar-1990	ND	0.030	UGG
		99	ALDRN	06-mar-1990	LT	0.290	UGG
		99	ANAPNE	06-mar-1990	LT	0.410	UGG
		99	ANAPYL	06-mar-1990	LT	0.460	UGG
		99	ANTRC	06-mar-1990	LT	0.540	UGG
		99	B2CEXM	06-mar-1990	ND	0.330	UGG
		99	B2CIPE	06-mar-1990	ND	0.330	UGG
		99	B2CLEE	06-mar-1990	LT	0.330	UGG
		99	B2EHP	06-mar-1990	LT	0.390	UGG
		99	BAANTR	06-mar-1990	LT	0.300	UGG
		99	BAPYR	06-mar-1990	LT	0.380	UGG
		99	BBFANT	06-mar-1990	LT	0.360	UGG
		99	BBHC	06-mar-1990	LT	0.360	UGG
		99	BBZP	06-mar-1990	ND	0.330	UGG
		99	BENSLF	06-mar-1990	ND	0.200	UGG
		99	BENZOA	06-mar-1990	ND	1.700	UGG
		99	BGHIPY	06-mar-1990	LT	0.240	UGG
		99	BKFANT	06-mar-1990	LT	0.800	UGG
		99	BZALC	06-mar-1990	ND	0.330	UGG
		99	CHRY	06-mar-1990	LT	0.450	UGG
		99	CL6BZ	06-mar-1990	LT	0.260	UGG
		99	CL6CP	06-mar-1990	ND	0.330	UGG
		99	CL6ET	06-mar-1990	LT	0.400	UGG
		99	CLDAN	06-mar-1990	ND	0.330	UGG
		99	CPMS	06-mar-1990	LT	0.370	UGG
		99	CPMSO	06-mar-1990	LT	0.270	UGG
		99	CPMSO2	06-mar-1990	LT	0.690	UGG
		99	DBAHA	06-mar-1990	LT	0.200	UGG
		99	DBHC	06-mar-1990	LT	0.290	UGG
		99	DBZFUR	06-mar-1990	ND	0.330	UGG
		99	DEP	06-mar-1990	ND	0.330	UGG
		99	DITH	06-mar-1990	LT	0.240	UGG
		99	DLDRN	06-mar-1990	LT	0.300	UGG
		99	DMP	06-mar-1990	ND	0.330	UGG
		99	DNBP	06-mar-1990	ND	0.330	UGG
		99	DNOP	06-mar-1990	LT	0.590	UGG
		99	ENDRN	06-mar-1990	LT	0.410	UGG
		99	ENDRNK	06-mar-1990	ND	0.200	UGG
		99	ESFSO4	06-mar-1990	ND	0.200	UGG
		99	FANT	06-mar-1990	LT	0.520	UGG
		99	FLRENE	06-mar-1990	ND	0.330	UGG
		99	HCBD	06-mar-1990	LT	0.420	UGG
		99	HPCL	06-mar-1990	LT	0.280	UGG
		99	HPCLE	06-mar-1990	LT	0.360	UGG
		99	ICDPYR	06-mar-1990	LT	0.210	UGG
		99	ISOPHR	06-mar-1990	ND	0.330	UGG

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Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-01-01	99	LIN	06-mar-1990	LT	0.430	UGG
		99	MEXCLR	06-mar-1990	ND	1.000	UGG
		99	MLTHN	06-mar-1990	LT	0.480	UGG
		99	NAP	06-mar-1990	LT	0.420	UGG
		99	NB	06-mar-1990	ND	0.330	UGG
		99	NDNPA	06-mar-1990	LT	0.360	UGG
		99	NNDPA	06-mar-1990	ND	0.330	UGG
		99	OXAT	06-mar-1990	LT	0.250	UGG
		99	PB	06-mar-1990		15.660	UGG
		99	PCP	06-mar-1990	ND	1.700	UGG
		99	PHANTR	06-mar-1990	LT	0.410	UGG
		99	PHENOL	06-mar-1990	ND	0.330	UGG
		99	PPDDD	06-mar-1990	LT	0.180	UGG
		99	PPDDE	06-mar-1990	LT	0.220	UGG
		99	PPDDT	06-mar-1990	LT	0.410	UGG
		99	PRTHN	06-mar-1990	LT	0.460	UGG
		99	PYR	06-mar-1990	LT	0.420	UGG
		99	SE	06-mar-1990	ND	4.100	UGG
		99	SN	30-may-1990	LT	100.000	UGL
		99	SULFID	06-mar-1990	LT	0.280	UGG
		JB03	HG	06-mar-1990		0.100	UGG
		JD13	AS	06-mar-1990		21.600	UGG
		JS10	AL	06-mar-1990		21214.200	UGG
		JS10	BA	06-mar-1990		23.600	UGG
		JS10	BE	06-mar-1990		0.100	UGG
		JS10	CA	06-mar-1990		158.800	UGG
		JS10	CD	06-mar-1990	LT	2.000	UGG
		JS10	CO	06-mar-1990	LT	2.400	UGG
		JS10	CR	06-mar-1990		18.000	UGG
		JS10	CU	06-mar-1990		6.400	UGG
		JS10	FE	06-mar-1990		12182.400	UGG
		JS10	K	06-mar-1990		472.000	UGG
		JS10	MG	06-mar-1990		394.600	UGG
		JS10	MN	06-mar-1990		17.700	UGG
		JS10	NA	06-mar-1990	LT	40.200	UGG
		JS10	NI	06-mar-1990		2.700	UGG
		JS10	SB	06-mar-1990	LT	4.300	UGG
		JS10	TL	06-mar-1990	LT	2.800	UGG
		JS10	V	06-mar-1990		13.700	UGG
		JS10	ZN	06-mar-1990		13.600	UGG
		KY05	CYN	06-mar-1990	LT	0.600	UGG
BORE	SUT-01-02	99	123TCB	06-mar-1990	LT	0.290	UGG
		99	124TCB	06-mar-1990	LT	0.290	UGG
		99	12DCLB	06-mar-1990	LT	0.330	UGG
		99	13DCLB	06-mar-1990	LT	0.330	UGG
		99	14DCLB	06-mar-1990	LT	0.320	UGG

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Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-01-02	99	245TCP	06-mar-1990	ND	1.700	UGG
		99	246TCP	06-mar-1990	ND	1.700	UGG
		99	24DCLP	06-mar-1990	ND	0.330	UGG
		99	24DMPN	06-mar-1990	ND	0.330	UGG
		99	24DNP	06-mar-1990	ND	1.700	UGG
		99	24DNT	06-mar-1990	LT	0.390	UGG
		99	26DNT	06-mar-1990	LT	0.530	UGG
		99	2CLP	06-mar-1990	ND	0.330	UGG
		99	2CNAP	06-mar-1990	LT	0.320	UGG
		99	2MNAP	06-mar-1990	ND	0.330	UGG
		99	2MP	06-mar-1990	ND	0.330	UGG
		99	2NANIL	06-mar-1990	ND	1.700	UGG
		99	2NP	06-mar-1990	ND	0.330	UGG
		99	33DCBD	06-mar-1990	ND	0.200	UGG
		99	3NANIL	06-mar-1990	ND	1.700	UGG
		99	46DN2C	06-mar-1990	ND	1.700	UGG
		99	4BRPPE	06-mar-1990	ND	0.330	UGG
		99	4CANIL	06-mar-1990	ND	0.330	UGG
		99	4CL3C	06-mar-1990	ND	0.330	UGG
		99	4CLPPE	06-mar-1990	ND	0.330	UGG
		99	4MP	06-mar-1990	ND	0.330	UGG
		99	4NANIL	06-mar-1990	ND	1.700	UGG
		99	4NP	06-mar-1990	ND	1.700	UGG
		99	ABHC	06-mar-1990	LT	0.460	UGG
		99	ACLDAN	06-mar-1990	ND	1.000	UGG
		99	AENSLF	06-mar-1990	ND	0.100	UGG
		99	AG	06-mar-1990	ND	0.030	UGG
		99	ALDRN	06-mar-1990	LT	0.290	UGG
		99	ANAPNE	06-mar-1990	LT	0.410	UGG
		99	ANAPYL	06-mar-1990	LT	0.460	UGG
		99	ANTRC	06-mar-1990	LT	0.540	UGG
		99	B2CEXM	06-mar-1990	ND	0.330	UGG
		99	B2CIPE	06-mar-1990	ND	0.330	UGG
		99	B2CLEE	06-mar-1990	LT	0.330	UGG
		99	B2EHP	06-mar-1990	LT	0.390	UGG
		99	BAANTR	06-mar-1990	LT	0.300	UGG
		99	BAPYR	06-mar-1990	LT	0.380	UGG
		99	BBFANT	06-mar-1990	LT	0.360	UGG
		99	BBHC	06-mar-1990	LT	0.360	UGG
		99	BBZP	06-mar-1990	ND	0.330	UGG
		99	BENSLF	06-mar-1990	ND	0.200	UGG
		99	BENZOA	06-mar-1990	ND	1.700	UGG
		99	BGHIPY	06-mar-1990	LT	0.240	UGG
		99	BKFANT	06-mar-1990	LT	0.800	UGG
		99	BZALC	06-mar-1990	ND	0.330	UGG
		99	CHRY	06-mar-1990	LT	0.450	UGG
		99	CL6BZ	06-mar-1990	LT	0.260	UGG
		99	CL6CP	06-mar-1990	ND	0.330	UGG
		99	CL6ET	06-mar-1990	LT	0.400	UGG
		99	CLDAN	06-mar-1990	ND	0.330	UGG
		99	CPMS	06-mar-1990	LT	0.370	UGG

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Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-01-02	99	CPMSO	06-mar-1990	LT	0.270	UGG
		99	CPMSO2	06-mar-1990	LT	0.690	UGG
		99	DBAHA	06-mar-1990	LT	0.200	UGG
		99	DBHC	06-mar-1990	LT	0.290	UGG
		99	DBZFUR	06-mar-1990	ND	0.330	UGG
		99	DEP	06-mar-1990	ND	0.330	UGG
		99	DITH	06-mar-1990	LT	0.240	UGG
		99	DLDRN	06-mar-1990	LT	0.300	UGG
		99	DMP	06-mar-1990	ND	0.330	UGG
		99	DNBP	06-mar-1990	ND	0.330	UGG
		99	DNOP	06-mar-1990	LT	0.590	UGG
		99	ENDRN	06-mar-1990	LT	0.410	UGG
		99	ENDRNK	06-mar-1990	ND	0.200	UGG
		99	ESFSO4	06-mar-1990	ND	0.200	UGG
		99	FANT	06-mar-1990	LT	0.520	UGG
		99	FLRENE	06-mar-1990	ND	0.330	UGG
		99	HCBD	06-mar-1990	LT	0.420	UGG
		99	HPCL	06-mar-1990	LT	0.280	UGG
		99	HPCLE	06-mar-1990	LT	0.360	UGG
		99	ICDPYR	06-mar-1990	LT	0.210	UGG
		99	ISOPHR	06-mar-1990	ND	0.330	UGG
		99	LIN	06-mar-1990	LT	0.430	UGG
		99	MEXCLR	06-mar-1990	ND	1.000	UGG
		99	MLTHN	06-mar-1990	LT	0.480	UGG
		99	NAP	06-mar-1990	LT	0.420	UGG
		99	NB	06-mar-1990	ND	0.330	UGG
		99	NDNPA	06-mar-1990	LT	0.360	UGG
		99	NNDPA	06-mar-1990	ND	0.330	UGG
		99	OXAT	06-mar-1990	LT	0.250	UGG
		99	PB	06-mar-1990		14.930	UGG
		99	PCP	06-mar-1990	ND	1.700	UGG
		99	PHANTR	06-mar-1990	LT	0.410	UGG
		99	PHENOL	06-mar-1990	ND	0.330	UGG
		99	PPDDD	06-mar-1990	LT	0.180	UGG
		99	PPDDE	06-mar-1990	LT	0.220	UGG
		99	PPDDT	06-mar-1990	LT	0.410	UGG
		99	PRTHN	06-mar-1990	LT	0.460	UGG
		99	PYR	06-mar-1990	LT	0.420	UGG
		99	SE	06-mar-1990	ND	4.100	UGG
		99	SN	30-may-1990		161.000	UGL
		99	SULFID	06-mar-1990	LT	0.280	UGG
		JB03	HG	06-mar-1990		0.100	UGG
		JD13	AS	06-mar-1990		22.700	UGG
		JS10	AL	06-mar-1990	GT	22500.000	UGG
		JS10	BA	06-mar-1990		25.100	UGG
		JS10	BE	06-mar-1990		0.200	UGG
		JS10	CA	06-mar-1990		100.900	UGG
		JS10	CD	06-mar-1990	LT	2.000	UGG

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Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-01-02	JS10	CO	06-mar-1990	LT	2.400	UGG
		JS10	CR	06-mar-1990		19.500	UGG
		JS10	CU	06-mar-1990		7.500	UGG
		JS10	FE	06-mar-1990		15914.300	UGG
		JS10	K	06-mar-1990		469.600	UGG
		JS10	MG	06-mar-1990		417.200	UGG
		JS10	MN	06-mar-1990		21.600	UGG
		JS10	NA	06-mar-1990	LT	40.200	UGG
		JS10	NI	06-mar-1990		6.200	UGG
		JS10	SB	06-mar-1990	LT	4.300	UGG
		JS10	TL	06-mar-1990	LT	2.800	UGG
		JS10	V	06-mar-1990		19.300	UGG
		JS10	ZN	06-mar-1990		11.400	UGG
		KY05	CYN	06-mar-1990	LT	0.600	UGG
BORE	SUT-02-01	99	123TCB	06-mar-1990	LT	0.290	UGG
		99	124TCB	06-mar-1990	LT	0.290	UGG
		99	12DCLB	06-mar-1990	LT	0.330	UGG
		99	13DCLB	06-mar-1990	LT	0.330	UGG
		99	14DCLB	06-mar-1990	LT	0.320	UGG
		99	245TCP	06-mar-1990	ND	1.700	UGG
		99	246TCP	06-mar-1990	ND	1.700	UGG
		99	24DCLP	06-mar-1990	ND	0.330	UGG
		99	24DMPN	06-mar-1990	ND	0.330	UGG
		99	24DNP	06-mar-1990	ND	1.700	UGG
		99	24DNT	06-mar-1990	LT	0.390	UGG
		99	26DNT	06-mar-1990	LT	0.530	UGG
		99	2CLP	06-mar-1990	ND	0.330	UGG
		99	2CNAP	06-mar-1990	LT	0.320	UGG
		99	2MNAP	06-mar-1990	ND	0.330	UGG
		99	2MP	06-mar-1990	ND	0.330	UGG
		99	2NANIL	06-mar-1990	ND	1.700	UGG
		99	2NP	06-mar-1990	ND	0.330	UGG
		99	33DCBD	06-mar-1990	ND	0.200	UGG
		99	3NANIL	06-mar-1990	ND	1.700	UGG
		99	46DN2C	06-mar-1990	ND	1.700	UGG
		99	4BRPPE	06-mar-1990	ND	0.330	UGG
		99	4CANIL	06-mar-1990	ND	0.330	UGG
		99	4CL3C	06-mar-1990	ND	0.330	UGG
		99	4CLPPE	06-mar-1990	ND	0.330	UGG
		99	4MP	06-mar-1990	ND	0.330	UGG
		99	4NANIL	06-mar-1990	ND	1.700	UGG
		99	4NP	06-mar-1990	ND	1.700	UGG
		99	ABHC	06-mar-1990	LT	0.460	UGG
		99	ACLDAN	06-mar-1990	ND	1.000	UGG
		99	AENSLF	06-mar-1990	ND	0.100	UGG
		99	AG	06-mar-1990	ND	0.030	UGG
		99	ALDRN	06-mar-1990	LT	0.290	UGG
		99	ANAPNE	06-mar-1990	LT	0.410	UGG
		99	ANAPYL	06-mar-1990	LT	0.460	UGG

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Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-02-01	99	ANTRC	06-mar-1990	LT	0.540	UGG
		99	B2CEXM	06-mar-1990	ND	0.330	UGG
		99	B2CIPE	06-mar-1990	ND	0.330	UGG
		99	B2CLEE	06-mar-1990	LT	0.330	UGG
		99	B2EHP	06-mar-1990	LT	0.390	UGG
		99	BAANTR	06-mar-1990	LT	0.300	UGG
		99	BAPYR	06-mar-1990	LT	0.380	UGG
		99	BBFANT	06-mar-1990	LT	0.360	UGG
		99	BBHC	06-mar-1990	LT	0.360	UGG
		99	BBZP	06-mar-1990	ND	0.330	UGG
		99	BENSLF	06-mar-1990	ND	0.200	UGG
		99	BENZOA	06-mar-1990	ND	1.700	UGG
		99	BGHIPY	06-mar-1990	LT	0.240	UGG
		99	BKFANT	06-mar-1990	LT	0.800	UGG
		99	BZALC	06-mar-1990	ND	0.330	UGG
		99	CHRY	06-mar-1990	LT	0.450	UGG
		99	CL6BZ	06-mar-1990	LT	0.260	UGG
		99	CL6CP	06-mar-1990	ND	0.330	UGG
		99	CL6ET	06-mar-1990	LT	0.400	UGG
		99	CLDAN	06-mar-1990	ND	0.330	UGG
		99	CPMS	06-mar-1990	LT	0.370	UGG
		99	CPMSO	06-mar-1990	LT	0.270	UGG
		99	CPMSO2	06-mar-1990	LT	0.690	UGG
		99	DBAHA	06-mar-1990	LT	0.200	UGG
		99	DBHC	06-mar-1990	LT	0.290	UGG
		99	DBZFUR	06-mar-1990	ND	0.330	UGG
		99	DEP	06-mar-1990	ND	0.330	UGG
		99	DITH	06-mar-1990	LT	0.240	UGG
		99	DLDRN	06-mar-1990	LT	0.300	UGG
		99	DMP	06-mar-1990	ND	0.330	UGG
		99	DNBP	06-mar-1990	ND	0.330	UGG
		99	DNOP	06-mar-1990	LT	0.590	UGG
		99	ENDRN	06-mar-1990	LT	0.410	UGG
		99	ENDRNK	06-mar-1990	ND	0.200	UGG
		99	ESFSO4	06-mar-1990	ND	0.200	UGG
		99	FANT	06-mar-1990	LT	0.520	UGG
		99	FLRENE	06-mar-1990	ND	0.330	UGG
		99	HCBD	06-mar-1990	LT	0.420	UGG
		99	HPCL	06-mar-1990	LT	0.280	UGG
		99	HPCLE	06-mar-1990	LT	0.360	UGG
		99	ICDPYR	06-mar-1990	LT	0.210	UGG
		99	ISOPHR	06-mar-1990	ND	0.330	UGG
		99	LIN	06-mar-1990	LT	0.430	UGG
		99	MEXCLR	06-mar-1990	ND	1.000	UGG
		99	MLTHN	06-mar-1990	LT	0.480	UGG
		99	NAP	06-mar-1990	LT	0.420	UGG
		99	NB	06-mar-1990	ND	0.330	UGG
		99	NDNPA	06-mar-1990	LT	0.360	UGG
		99	NNDPA	06-mar-1990	ND	0.330	UGG
		99	OXAT	06-mar-1990	LT	0.250	UGG
		99	PB	06-mar-1990		29.970	UGG

CHEMICAL REPORT
Installation: NIKE PHILA 41/43(CLEMNTN) NJ (J1)
Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-02-01	99	PCP	06-mar-1990	ND	1.700	UGG
		99	PHANTR	06-mar-1990	LT	0.410	UGG
		99	PHENOL	06-mar-1990	ND	0.330	UGG
		99	PPDDD	06-mar-1990	LT	0.180	UGG
		99	PPDDE	06-mar-1990	LT	0.220	UGG
		99	PPDDT	06-mar-1990	LT	0.410	UGG
		99	PRTHN	06-mar-1990	LT	0.460	UGG
		99	PYR	06-mar-1990	LT	0.420	UGG
		99	SE	06-mar-1990	ND	4.100	UGG
		99	SN	30-may-1990	LT	100.000	UGL
		99	SULFID	06-mar-1990	LT	0.280	UGG
		JB03	HG	06-mar-1990		0.000	UGG
		JD13	AS	06-mar-1990		8.600	UGG
		JS10	AL	06-mar-1990		8515.400	UGG
		JS10	BA	06-mar-1990		15.200	UGG
		JS10	BE	06-mar-1990	LT	0.100	UGG
		JS10	CA	06-mar-1990		456.100	UGG
		JS10	CD	06-mar-1990	LT	2.000	UGG
		JS10	CO	06-mar-1990	LT	2.400	UGG
		JS10	CR	06-mar-1990		11.500	UGG
		JS10	CU	06-mar-1990		3.700	UGG
		JS10	FE	06-mar-1990		8021.900	UGG
		JS10	K	06-mar-1990		182.000	UGG
		JS10	MG	06-mar-1990		239.800	UGG
		JS10	MN	06-mar-1990		16.300	UGG
		JS10	NA	06-mar-1990	LT	40.200	UGG
		JS10	NI	06-mar-1990		3.000	UGG
		JS10	SB	06-mar-1990	LT	4.300	UGG
		JS10	TL	06-mar-1990	LT	2.800	UGG
		JS10	V	06-mar-1990	LT	4.700	UGG
		JS10	ZN	06-mar-1990		18.500	UGG
		KY05	CYN	06-mar-1990	LT	0.600	UGG
BORE	SUT-02-02	99	123TCB	06-mar-1990	LT	0.290	UGG
		99	124TCB	06-mar-1990	LT	0.290	UGG
		99	12DCLB	06-mar-1990	LT	0.330	UGG
		99	13DCLB	06-mar-1990	LT	0.330	UGG
		99	14DCLB	06-mar-1990	LT	0.320	UGG
		99	245TCP	06-mar-1990	ND	1.700	UGG
		99	246TCP	06-mar-1990	ND	1.700	UGG
		99	24DCLP	06-mar-1990	ND	0.330	UGG
		99	24DMPN	06-mar-1990	ND	0.330	UGG
		99	24DNP	06-mar-1990	ND	1.700	UGG
		99	24DNT	06-mar-1990	LT	0.390	UGG
		99	26DNT	06-mar-1990	LT	0.530	UGG
		99	2CLP	06-mar-1990	ND	0.330	UGG
		99	2CNAP	06-mar-1990	LT	0.320	UGG

CHEMICAL REPORT
Installation: NIKE PHILA 41/43(CLEMNTN) NJ (J1)
Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-02-02	99	2MNAP	06-mar-1990	ND	0.330	UGG
		99	2MP	06-mar-1990	ND	0.330	UGG
		99	2NANIL	06-mar-1990	ND	1.700	UGG
		99	2NP	06-mar-1990	ND	0.330	UGG
		99	33DCBD	06-mar-1990	ND	0.200	UGG
		99	3NANIL	06-mar-1990	ND	1.700	UGG
		99	46DN2C	06-mar-1990	ND	1.700	UGG
		99	4BRPPE	06-mar-1990	ND	0.330	UGG
		99	4CANIL	06-mar-1990	ND	0.330	UGG
		99	4CL3C	06-mar-1990	ND	0.330	UGG
		99	4CLPPE	06-mar-1990	ND	0.330	UGG
		99	4MP	06-mar-1990	ND	0.330	UGG
		99	4NANIL	06-mar-1990	ND	1.700	UGG
		99	4NP	06-mar-1990	ND	1.700	UGG
		99	ABHC	06-mar-1990	LT	0.460	UGG
		99	ACLDAN	06-mar-1990	ND	1.000	UGG
		99	AENSLF	06-mar-1990	ND	0.100	UGG
		99	AG	06-mar-1990		0.670	UGG
		99	ALDRN	06-mar-1990	LT	0.290	UGG
		99	ANAPNE	06-mar-1990	LT	0.410	UGG
		99	ANAPYL	06-mar-1990	LT	0.460	UGG
		99	ANTRC	06-mar-1990	LT	0.540	UGG
		99	B2CEXM	06-mar-1990	ND	0.330	UGG
		99	B2CIPE	06-mar-1990	ND	0.330	UGG
		99	B2CLEE	06-mar-1990	LT	0.330	UGG
		99	B2EHP	06-mar-1990	LT	0.390	UGG
		99	BAANTR	06-mar-1990	LT	0.300	UGG
		99	BAPYR	06-mar-1990	LT	0.380	UGG
		99	BBFANT	06-mar-1990	LT	0.360	UGG
		99	BBHC	06-mar-1990	LT	0.360	UGG
		99	BBZP	06-mar-1990	ND	0.330	UGG
		99	BENSLF	06-mar-1990	ND	0.200	UGG
		99	BENZOA	06-mar-1990	ND	1.700	UGG
		99	BGHIPY	06-mar-1990	LT	0.240	UGG
		99	BKFANT	06-mar-1990	LT	0.800	UGG
		99	BZALC	06-mar-1990	ND	0.330	UGG
		99	CHRY	06-mar-1990	LT	0.450	UGG
		99	CL6BZ	06-mar-1990	LT	0.260	UGG
		99	CL6CP	06-mar-1990	ND	0.330	UGG
		99	CL6ET	06-mar-1990	LT	0.400	UGG
		99	CLDAN	06-mar-1990	ND	0.330	UGG
		99	CPMS	06-mar-1990	LT	0.370	UGG
		99	CPMSO	06-mar-1990	LT	0.270	UGG
		99	CPMSO2	06-mar-1990	LT	0.690	UGG
		99	DBAHA	06-mar-1990	LT	0.200	UGG
		99	DBHC	06-mar-1990	LT	0.290	UGG
		99	DBZFUR	06-mar-1990	ND	0.330	UGG
		99	DEP	06-mar-1990	ND	0.330	UGG
		99	DITH	06-mar-1990	LT	0.240	UGG
		99	DLDRN	06-mar-1990	LT	0.300	UGG
		99	DMP	06-mar-1990	ND	0.330	UGG

CHEMICAL REPORT
Installation: NIKE PHILA 41/43(CLEMNTN) NJ (J1)
Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-02-02	99	DNBP	06-mar-1990	ND	0.330	UGG
		99	DNOP	06-mar-1990	LT	0.590	UGG
		99	ENDRN	06-mar-1990	LT	0.410	UGG
		99	ENDRNK	06-mar-1990	ND	0.200	UGG
		99	ESFSO4	06-mar-1990	ND	0.200	UGG
		99	FANT	06-mar-1990	LT	0.520	UGG
		99	FLRENE	06-mar-1990	ND	0.330	UGG
		99	HCBD	06-mar-1990	LT	0.420	UGG
		99	HPCL	06-mar-1990	LT	0.280	UGG
		99	HPCLE	06-mar-1990	LT	0.360	UGG
		99	ICDPYR	06-mar-1990	LT	0.210	UGG
		99	ISOPHR	06-mar-1990	ND	0.330	UGG
		99	LIN	06-mar-1990	LT	0.430	UGG
		99	MEXCLR	06-mar-1990	ND	1.000	UGG
		99	MLTHN	06-mar-1990	LT	0.480	UGG
		99	NAP	06-mar-1990	LT	0.420	UGG
		99	NB	06-mar-1990	ND	0.330	UGG
		99	NDNPA	06-mar-1990	LT	0.360	UGG
		99	NNDPA	06-mar-1990	ND	0.330	UGG
		99	OXAT	06-mar-1990	LT	0.250	UGG
		99	PB	06-mar-1990		18.350	UGG
		99	PCP	06-mar-1990	ND	1.700	UGG
		99	PHANTR	06-mar-1990	LT	0.410	UGG
		99	PHENOL	06-mar-1990	ND	0.330	UGG
		99	PPDDD	06-mar-1990	LT	0.180	UGG
		99	PPDDE	06-mar-1990	LT	0.220	UGG
		99	PPDDT	06-mar-1990	LT	0.410	UGG
		99	PRTHN	06-mar-1990	LT	0.460	UGG
		99	PYR	06-mar-1990	LT	0.420	UGG
		99	SE	06-mar-1990	ND	4.100	UGG
		99	SN	30-may-1990		124.000	UGL
		99	SULFID	06-mar-1990	LT	0.290	UGG
		JB03	HG	06-mar-1990	LT	0.000	UGG
		JD13	AS	06-mar-1990		25.600	UGG
		JS10	AL	06-mar-1990	GT	22500.000	UGG
		JS10	BA	06-mar-1990		14.700	UGG
		JS10	BE	06-mar-1990		0.200	UGG
		JS10	CA	06-mar-1990		142.400	UGG
		JS10	CD	06-mar-1990	LT	2.000	UGG
		JS10	CO	06-mar-1990	LT	2.400	UGG
		JS10	CR	06-mar-1990		18.200	UGG
		JS10	CU	06-mar-1990		6.900	UGG
		JS10	FE	06-mar-1990		14760.700	UGG
		JS10	K	06-mar-1990		279.800	UGG
		JS10	MG	06-mar-1990		236.900	UGG
		JS10	MN	06-mar-1990		14.200	UGG
		JS10	NA	06-mar-1990	LT	40.200	UGG
		JS10	NI	06-mar-1990		1.900	UGG

CHEMICAL REPORT
Installation: NIKE PHILA 41/43(CLEMNTN) NJ (J1)
Media File Code: CSO Sampling Date Range: 01-JAN-1990 to 31-JUL-1990

Site Type	Site ID	Method Code	Test Name	Sample Date	Meas. Bool.	Value	Unit Meas.
BORE	SUT-02-02	JS10	SB	06-mar-1990	LT	4.300	UGG
		JS10	TL	06-mar-1990	LT	2.800	UGG
		JS10	V	06-mar-1990		17.000	UGG
		JS10	ZN	06-mar-1990		6.100	UGG
		KY05	CYN	06-mar-1990	LT	0.600	UGG

** End of Report - 590 Records Found **

APPENDIX C.1. FIELD LOGS, TRANSFORMER SAMPLING

WEDNESDAY at 1:30 pm.

FEBRUARY 27, 1990

0800 0800 Arrived at Mobile, Collegville, to rent bucket truck.

0930 Arrived at the Clementon Site & unlocked gate

From local stoe we got directions to the nearest hospital

1030 Collected first sample on pole just outside of House # 306. R. Evans in Saranex suit, nitrile gloves, & booties. With a hard hat & face shield, Rick opened the inspection plate on the top & sampled as follows:

(1) Stirred up (Agitated oil as much as possible)
(2) inserted a turkey baster down as far as possible & collected sample.
(3) oil was ≈ 3/4 full
(4) Plate, with gasket, was resealed.

(1) SAMPLE # NJ-M17-PCB-01

Name plate info:

Signal Transformer Corporation
SN 5133-23
25 KVA Spec # 3715-A

1100 Startec
Single
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(2) SAM

Plate c
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(3) SAMPL
SN
Spec

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1990

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...s resealed.

...-PCB-01

Corporation

...# 3715-A

1100 Started to collect Second sample of Single pole-mounted transformer which is marked on my map (note: It is just outside of House 318 across from the Park Bus Stop.

Collected sample #2 by procedure described for sample #1

(2) SAMPLE # NJ-N17-PCB-02 KOP

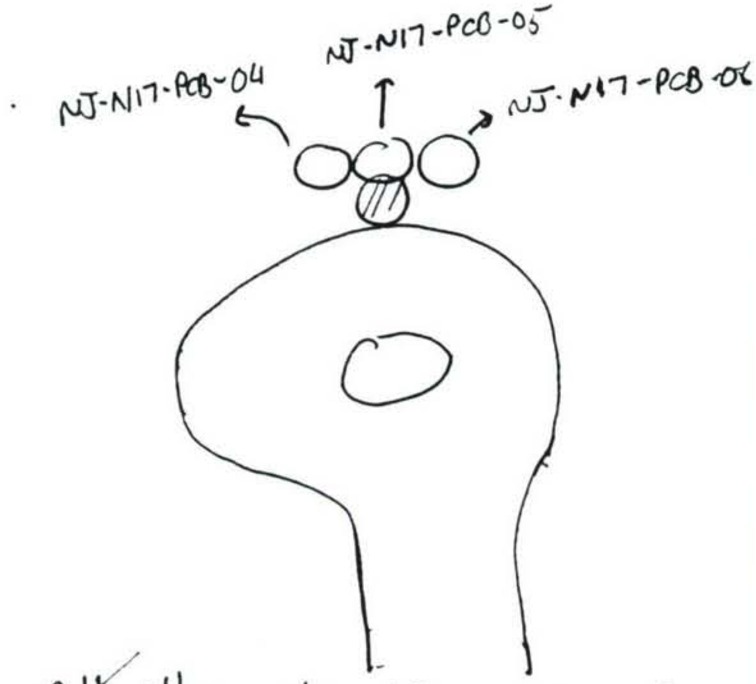
Plate could not be read but transformer appears to be the same as the ~~EAST~~ previous one.

1130 Started to sample, as above, single pole mounted transformer between houses 324 and 326, MARKED AS SUCH ON THE MAP. AGAIN transformer appears to be the same as the other two

(3) SAMPLE # NJ-N17-PCB-03
SN 5133-18
25 KVA
Spec 3715-A
555 LBS

SIGNAL TRANSFORMER

1200 Started to sample the three pole mounted trasformers at the end of the cul de sac



- All three transformers are of a different type than the ones previously sampled before. They are located on a single pole

4 **SAMPLE NJ-N17-PCB-04**
Transformer has a white 6 written on it
GE-SpiraKore
15 KVA
C572541-56P

5 **SAMPLE NJ-N17-PCB-05**
transformer has a white 5 written on it
15 KVA NO serial #
Spec 1754-A Central Transf. Corp.
Yr 1953

6 **SAMPLE NJ-N17-PCB-06**
transformer has a white 4 on it

15 KV
C57
GE- Spir

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GRANDVIEW L

Transformer
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Transformer
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15 KVA

#C57260256P

GE- SPIRAKORE TYPE

All gloves & turkey basters were put in the pumphouse after sampling (end of cul-de-sac

1315 left site.

1728 Arrived in Spring Valley, N.Y.

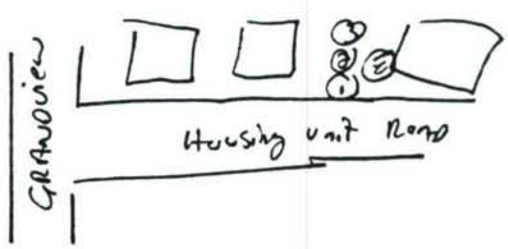
FEBRUARY 28, 1990

SPRING VALLEY

1200 Arrived at the site & prepared to sample

1300 Power company personnel arrived & pulled the cut outs. In addition, they tested the wires. Tested o.k. Also, Freeman present from Army Contractor.

1310 Rick Evans started with the three transformers in the Housing Area.



Transformer #1 - Could not get eye bolt off the top.

Transformer #2 - Removed Bolt but could not get Lid off.

-N17-PCB-08

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Transf. Corp.

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APPENDIX C.2. LABORATORY DATA, TRANSFORMER OIL SAMPLES

WESTON Analytics - Dedicated Lab

CLIENT: USATHAMA-ANL
RFW # : 9003L686
W.O.# : 2104-13-01-0000

DATA QUALIFIER

1. The following qualifiers are used on the data summary:

   U - Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).

   J - Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.

   BS - Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.

   BSD - Indicates blank spike duplicate.

   MS - Indicates matrix spike.

   MSD - Indicates matrix spike duplicate.

   DL - Indicates that surrogate recoveries were not obtained because the extract had to be diluted for analysis.

   NA - Not applicable.

   DF - Dilution factor.

   NR - Not required.

   I - Interference.

Steph D. Wesson
J. Michael Taylor
Project Director
Lionville Analytical Laboratory

3-15-90
DATE

15/90 09:23
Page: 1

N17-PCB-O
4
006
OIL
25.0
ug/g

46	U
46	U
46	U
46	U
46	U
92	U
180	

BLK BS

0071-MB2
OIL
5.00
ug/g

12	U
12	U
12	U
12	U
12	U
98	%
24	U

spiked.

Roy F. Weston, Inc. - Lionville Laboratory
PCBs by GC

RFW Batch Number: 9003L686 Client: USATHAMA-ANL Work Order: 2104-13-01-0000 Report Date: 03/15/90 09:23 Page: 2

Cust ID: **PBLK BS**

Sample Information	RFW#:	**90DL0071-MB3**
	Matrix:	OIL
	D.F.:	5.00
	Units:	ug/g

Aroclor-1016	12	U
Aroclor-1221	12	U
Aroclor-1232	12	U
Aroclor-1242	12	U
Aroclor-1248	12	U
Aroclor-1254	90	%
Aroclor-1260	24	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Roy F. Weston, Inc. - Lionville Laboratory
PCB ANALYTICAL DATA PACKAGE FOR
USATHAMA-ANL

DATE RECEIVED: 03/05/90

RFW LOT # :9003L686

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CT-C40-PCB-01	001	OI	90DL0071	03/02/90	03/06/90	03/13/90
CT-C40-PCB-02	002	OI	90DL0071	03/02/90	03/06/90	03/13/90
NJ-N17-PCB-01	003	OI	90DL0071	02/27/90	03/06/90	03/13/90
NJ-N17-PCB-02	004	OI	90DL0071	02/27/90	03/06/90	03/14/90
NJ-N17-PCB-03	005	OI	90DL0071	02/27/90	03/06/90	03/14/90
NJ-N17-PCB-04	006	OI	90DL0071	02/27/90	03/06/90	03/14/90
NJ-N17-PCB-05	007	OI	90DL0071	02/27/90	03/06/90	03/14/90
NJ-N17-PCB-06	008	OI	90DL0071	02/27/90	03/06/90	03/14/90
NJ-N17-PCB-06	008 REP	OI	90DL0071	02/27/90	03/06/90	03/14/90

LAB QC:

PBLK	MB1	S	90DL0071	N/A	03/06/90	03/14/90
PBLK	MB1 BS	S	90DL0071	N/A	03/06/90	03/14/90
PBLK	MB2 BS	S	90DL0071	N/A	03/06/90	03/14/90
PBLK	MB3 BS	S	90DL0071	N/A	03/06/90	03/14/90